Enterprise 2.0: Integrating Web 2.0 into Organizational Business Structure

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Abstract

In a social environment, web 2.0 technologies offer significant benefits to enterprises willing to integrate the technology into their business. The most socio-technological systems which have gained much more attention and generated most interest from companies in recent years are blogs, social networking and wikis. However, web 2.0 technologies provide opportunities for companies that are able to implement them effectively. The overall purpose of this thesis is to describe and explore the use of web 2.0 technologies within and between enterprises as well as challenges associated with their use. Five interviews have been conducted to investigate the phenomena of how web 2.0 technologies are used in companies and challenges behind the use of these technologies. The results show that the uses and tasks of web 2.0 technologies differ from internal uses into external uses, from one company to other companies and even from one department to other departments. Also, the research finds that not all companies use web 2.0 technologies externally due to challenges like security issue, culture change and management experiences which prevent the further success of Enterprise 2.0.

Keywords
Web 2.0, Enterprise 2.0, Social media, ESSPs, Wiki, SNS, Blog, KM 2.0, Enterprise 2.0 Bull's eye.

Acknowledgement

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1 Introduction

1.1 Background

The recently adopted information and communication technologies (ICTs) may play an important role in changing the way of the business and education in organizations and can contribute towards changing the social environment of organizations on the individual level, group level and organizational level. The phenomenon of how ICTs is used in organizations to change their environment into a more social one that facilitates knowledge sharing and the development of ideas is captured by both the IT professionals and by several other professions who try to investigate this phenomenon (Kling et al., 2005). Web 2.0 is an example of these new ICTs.

New digital platforms for generating, sharing and refining knowledge are already popular over the Internet. These platforms are called collectively web 2.0 and have attracted the attention of many companies since these platforms allow companies to gain the valuable business benefits including more innovative products and services, better access to knowledge and sharing it, developing ideas, communicating with people and so on and so forth (McKinsey & Company, 2009).

Many companies are keen to integrate web 2.0 technologies into their organizational business structure. McAfee (2006) coined the term Enterprise 2.0 as shorthand for the use of web 2.0 technologies within and between companies in pursuit of business goals. The difference between web 2.0 and Enterprise 2.0 is that web 2.0 technologies are used on the public Internet whereas Enterprise 2.0 refers to the use of the same technologies within companies on the intranet and between companies on the extranet. In other words, Enterprise 2.0 is not web 2.0 but Enterprise 2.0 is "web 2.0 in companies".

Since web 2.0 ties people, ideas, content, processes, businesses, knowledge and systems together within and between enterprises, the new social technologies improve business communication with the outside partners like customers, suppliers, etc.

> *"we found that successful companies not only tightly integrate Web 2.0 technologies with the work flows of their employees but also create a 'networked company,' linking themselves with customers and suppliers through the use of Web 2.0 tools"* (McKinsey & Company, 2009, p. 1) .

However, some companies do not know how to use these technologies so the benefits of web 2.0 technologies are only for companies that understand how to use them (Chui, Miller and Roberts, 2009).

About 1,700 executives of industries and functional areas participated in responding to a survey made in 2009 (McKinsey & Company, 2009). The survey found that the most users of web 2.0 applications are enjoining benefits such as increased knowledge sharing. So, the current focus of knowledge management in companies is one of sharing knowledge more widely. According to this survey, some of the most popular communication and social technologies which have attracted more and more attention and most interest of companies are blogs, social networking and wikis.

With technology evolving, the Knowledge Management (KM) is shifting from a first phase of KM in which the knowledge and expertise are locked up in repositories into a second phase of KM where companies use the social dimension of web 2.0 technologies like blog, wiki and SNS with the concept of collective intelligence (Hideo and Shinichi, 2007). However, web 2.0 and Enterprise 2.0 are still fuzzy and should not be neglected from the academic perspectives.

Since web 2.0 technologies are new social technologies and the survey by McKinsey & Company (2009) showed them to have a great impact on businesses that know how to use them, they attracted my attention and caused an interest in investigating the use of these technologies in companies. So, this thesis is for all companies that share this interest of mine.

1.2 Problem Area and Research Questions

Although web 2.0 technologies have a vast array of opportunities, the previous studies found that some companies do not succeed in using these technologies (Chui et al., 2009; McAfee, 2009; Newman and Thomas, 2009). The inability of managers to understand the use of web 2.0 technologies and the levers of changes that come up with these technologies make companies fail in utilizing them (Chui et al., 2009). Management thinks that web 2.0 technologies are all used in the same ways for the same tasks and purposes. This means that not all companies are successful in the use of web 2.0 technologies since these technologies are still fuzzy and have some negative consequences which business leaders have to take into account.

Social informatics is an important term which describes the communication between ICT and society, as well as the use and consequences of ICTs.

> *"Social informatics refers to interdisciplinary study of the design, uses, and consequences of ICT that take into account their interaction with institutional and cultural context" (Kling et al., 2005, p.5).*

As organizational informatics refers to social informatics analyses limited within organizations where the participants are from identifiable organizations, the study of the use of web 2.0 in organizational structures fit within organizational informatics (Sawyer and Rosenbaum, 2000).

This research is designed to describe and explore the use of web 2.0 technologies in business companies. As I was investigating more detailed background information about the use of the new social technologies, then I decided to focus on challenges associated with the use of these technologies. The challenges arise when companies consider extending the use of web 2.0 technologies to external groups such as customers, suppliers and other community members. Thus, a consequence question has been posed about the challenges that hinder the further success of Enterprise 2.0. The reasoning behind the posing of this question will come clear more through the reading of this thesis.

Research question is:

   ❖ *How are global companies using web 2.0 technologies?*

Consequence question is:

   ❖ *What are the challenges behind using Enterprise 2.0 technologies?*

1.3 Research Purpose

This study aims to investigate the use of web 2.0 technologies within and between companies. The research also explores the negative consequences that are the main obstacle to the further success of Enterprise 2.0 and addresses the roles that should be taken by business leaders to avoid these issues.

1.4 Delimitation

Web 2.0 technologies are many and broad and therefore the research is restricted to most common technologies like blog, wiki and SNS. Although Enterprise 2.0 comprises both private and public organizations, the focus of this thesis is around global companies.

A "How" question can be extensive and therefore the topic should be restricted. Web 2.0 technologies can be used in many different fields so the most important delimitation of this thesis is that the study of using these technologies will be under the ceiling of the knowledge management area since the most common use of these technologies is for sharing knowledge (McKinsey & Company, 2009). This does not mean that the empirical findings will go through KM and KM 2.0 because the main focus of this thesis is on the real use of web 2.0 technologies. However, the literature gives an overview of KM 2.0 and explains the differences between the classic KM and KM 2.0.

The research will not go through the technical details related to the installation of web 2.0, nor does the thesis intend to develop a model. Neither does it expand an existing framework but instead it takes Enterprise 2.0 bull's eyes (McAfee, 2009) as a basic model for this study.

2 Literature Review

This chapter will describe relevant areas and concepts based on literature. This includes clarification of the most important concepts within Web 2.0, Enterprise 2.0 and their technologies. Also, the chapter presents differences between Enterprise 2.0 and Enterprise 1.0. The impact of using web 2.0 technologies on knowledge management, as well as the differences between the classic KM and KM 2.0 will be clarified. The chapter will continue by presenting models that show the role of Enterprise 2.0 in reducing Socio-technical gap. This chapter will then present model focusing on the sufficient use of Enterprise 2.0 technologies. The positive and negative consequences of Enterprise 2.0 technologies will also be presented.

2.1 Web 2.0 Understanding

New technologies collectively called web 2.0 appeared on the Internet in 2004 (Musser, O'Reilly and the O'Reilly Radar Team, 2006). These technologies allowed people to read and write on the Internet in order to share their ideas and knowledge with each other, receive more feedback, react more quickly, and make better decisions. Web 2.0 has dramatically promoted a beneficial interaction between individuals and businesses around the globe (Enterprise 2.0 conference, 2009). For example Facebook has changed the way we interact with the web; it has promoted us from being web users to active web partners.

Web 2.0 is a term coined by Dale Dougherty in O'Reilly Media and CMP Web 2.0 conference in 2004 in Francisco (Musser, O'Reilly and the O'Reilly, 2006).

Web 2.0 is a second phase in web evolution referring to a platform whereby users are able to create applications and content in a participatory and collaborative way. In fact, these new web applications encourage and facilitate information sharing, and participation on the World Wide Web.

> *"Web 2.0 is the network as platform, spanning all connected devices; web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an "architecture of participation," and going beyond the page metaphor of Web 1.0 to deliver rich user experience" (O'Reilly, 2005).*

The idea of content publishing belonging to Web 1.0 is replaced by Web 2.0 technologies which have different characteristics that distinguish it from Web 1.0 (Murugesan, 2007).

- Web 2.0 facilitates web design and updates (users embrace the latest content even without visiting the actual web page).

- It provides rich and reactive user interface.

- Web 2.0 allows its developers to create new applications easily and quickly by reusing or combining different applications or different information from different resources. Web 2.0 allows the participators to read and write.

- It establishes social network by encouraging interaction among people who have the same interest.

- Web 2.0 is a participatory web. This means, it allows free, open participation for its users.

There is a set of important functionalities behind Web 2.0 functioning. Among these functionalities are Adobe Flash (it is a method that adds animation and multimedia like text, video, audio and image to web page), RSS (Really Simple Syndication is a family of web feeds formats that publish frequently updated content like news headlines, new feeds about updates that happen in blogs and multimedia), and AJAX (Asynchronous Java Script and XML that retrieve the data from web servers asynchronously and provide updates without interfering, with the content of the existed page). (Kaplan and Haenlein, 2010)

Blogs, wikis, and social networking sites, etc are dynamic applications of web 2.0. These technologies are open sources because they help people to interact, share and update their ideas, videos and photos globally. In contrast, web 1.0 applications like e-mail have static content (not adaptable) and are closed source since the content of email is restricted only to its senders and receivers (Newman and Thomas, 2009; McAfee, 2009).

As web 2.0 has several sites that allow users to form online communities and share user created contents (UCCs) through users' participation and interaction with each other in an ever changing and growing space within the World Wide Web, you can consider web 2.0 as an umbrella term (Murugesan, 2007).

A Social web site is a union of social networking sites and social media sites. Some of the popular social networking sites are Facebook, MySpace etc and some of the most used social media sites are YouTube, Flickr, etc. These sites and their contents are created by end-users (Kaplan and Haenlein, 2010). Thus, User Generated Content (UGC) or User Created Content (UCC) achieved a broad popularity in 2005. Briefly, social media is applied to describe the various types of media that are available, created and shared by end-users. These types of media may be photos, videos, text (blog, microblog or comments), profiles, etc. Social media is often defined by web 2.0 technologies that people use to create and share information. These technologies are blog, wiki, SNS (ibid). So, Kaplan and Haenlein (2010) consider web 2.0 as a platform for the development of Social Media. Kaplan and Haenlein (2010) defined the social media:

> *"Social Media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content."* (Kaplan and Haenlein, 2010, p 61).

2.2 Web 2.0 Technologies

Web 2.0 technologies are many and extensive, so the focus of this study is on the most common web 2.0 technologies in the business environment like blogs, wikis and social networking based on the global online survey conducted by McKinsey (2009).

Blog: the term "blog" is derived from the term web log and this term was coined by Jorn Barger in 1997 referring to web-based communication tool (Anderson, 2007; Murugesan, 2007). The common term synonymous with blog is a "personal Web site" since a blog is usually personal with commentary and links (Blood, 2004). As a blog is a website on which people add their thoughts, links, comments and suggestions and other people trigger different issues on the same blog or on their own blog with links to the original blog, a blog is an efficient tool for initiating and following a distributed conversation and developing ideas not only at personal level but also through initiating dialogues with others (Efimova, 2004). The distributed conversation means that blog authors do not add their comments directly on someone's post but instead they prefer to comment on their own blogs and link from their blogs to the original blog. The distributed conversations between many blogs are also called "blogosphere stories" (Jenkins, 2003 cited in Moor and Efimova, 2004; Efimova 2004; Klamma, 2007). Blogosphere is easy to join at any time since contributors summarize the earlier arguments to make their blogs meaningful. But, a distributed conversation is difficult to follow by even the bloggers themselves (Moor and Efimova, 2004; Efimova 2004).

A blog is an automated website for publishing which lets people type in their observations and link to other interesting and useful websites or a particular post (Lears, 2003). It is not more than a collection of links and short commentaries about its author. The hyperlinks between blogs refer to specific sources that bloggers put in and read regularly so that other readers can find trusted sources; this is similar to references in scholarly publication (Mortensen and Walker, 2002). However, a blog has some characteristics which distinguish it from other forms of electronic communications such as email, instant messaging, short message service and multimedia message service etc.

- Blog is "a frequently updated website consisting of dated entries arranged in reverse chronological order". This means the contents are arranged from latest date to oldest date (Walker, 2003).

- Many bloggers enhancing their blogs with new feeds by encoding the content of blog in XML based format known as RSS (Really Simple Syndication). RSS feeds notify people about the updates that happen in the blogs (Ojala, 2004).

- Blog is used as "bulletin board" to support communication and knowledge sharing in teams (Röll, 2003).

- It allows people to search for information on the same websites or by linking to other websites so that people can read what others are doing (Anderson, 2007; Murugesan, 2007; Lears, 2003). In contrast, the email is anonymous except for senders and receivers.

Wiki: The word "wiki" means quick or fast in Hawaiian. The first wiki was created by Word Cunningham in 1995. Wiki is a website that allows anyone to create and edit content (Reinhart, 2005; Bean and Hott, 2005).

It is a great way to capture live information and give people complete freedom to add, remove and edit the information. It is also a fast and efficient way to give people the opportunity to share and communicate knowledge at any time and in any place (Reinhart, 2005). The first difference between wiki and blog is that wiki content is controlled by several providers while blog content controlled by just its provider. The other major difference is that a wiki user can change the original content while the blog user can only write their feedbacks to the original comment without changing it (Stephens, 2008).

Many organizations are using email as a collaborative tool. However, knowledge management that concerns business executives and organizations find that e-mail has its limits for powerful project management for instance, many e-mail messages could be lost and many threats such as viruses could be faced as well as much time could be wasted. Rather than e-mail, wiki is an easy to implement tool because you can see the editable or added readers or titles on the front page which link you to group of pages that can be edited, created, removed, etc. Moreover, most wikis have a roll back feature that lets editor restore the previous content. Companies can display their articles online using wikis so that they have the possibilities of receiving feedbacks from people that help them to develop their products (Bean and Hott, 2005).

Social Networking Site (SNS): A SNS is a site that creates a community of individuals with a common interest. It is a network which allows individuals to share their ideas, interests and interact online. The most popular social network sites that have attracted the attention of many people are Facebook and MySpace. Boyd and Ellison (2007) defined social network sites as web-based services where individuals create a profile and formulate list of connections with others that share the same interests. All these connections are shared so everyone is allowed to see the profile of other participants and can connect them. The participants of SNS are communicating with people who are already participating as part of a community on the social networking site (Boyd and Ellison, 2007).

A social network, just like any other network, consists of nodes and ties. Individuals and organizations are represented by nodes. These nodes are linked by one or more ties each representing a relationship such as friendship, kinship, knowledge or relationship based on beliefs. The social network sites contain hyperlinks to other web pages. The ability of the social network to collect and publish information has been a major factor in the success of the web from the beginning (Wasserman and Faust, 2008). As organizations want to have relations with their partners they establish social networking sites to connect with them.

2.3 Enterprise 2.0: Web 2.0 in Companies

Recently, intranet has changed its role from the first era- Enterprise 1.0 to the second era-Enterprise 2.0. Enterprise 1.0 refers to the traditional enterprises that integrate web 1.0 technologies like email, ERP, CRM etc into their businesses. These technologies are unidirectional top-down channels for communication and information. In contrast, Enterprise 2.0 refers to enterprises that integrate web 2.0 technologies like blog, wiki, SNS, etc into their businesses in order to create social communications. These technologies are creative, open workspace platforms concentrating on the workers, and their need, sharing knowledge (Carso et al., 2008) (see table 2.1).

Enterprise 2.0 is a term coined by McAfee in 2006 to describe how companies use emergent social software platforms (ESSPs) on their intranet and extranet to achieve their goals (McAfee, 2009). Web 2.0 sites such as Facebook, MySpace, YouTube, Google, Wikipedia, blog, etc. are examples of what McAfee called emergent social software platforms (ESSPs) (McAfee, 2009). McAfee (2009) breaks down the definition of ESSPs into:

> *"Social Software enables people to rendezvous, connect, interact or collaborate through computer-mediated communication and to form online communities.*
>
> *Platforms are digital environments in which collaboration and interaction are global visible and persistent over time.*
>
> *Emergent means that software is freeform and contains mechanism like links and tags to let the patterns and structure inherent in people's interactions become visible overtime.*
>
> *Freeform means the software is optional, free of imposed structure such as workflow, interdependencies and decision right allocation, indifferent to formal organizational identities and accepting of many types of data"* (McAfee, 2009, p.69).

Thus, Enterprise 2.0 is empowered by three things: web 2.0 technologies, the demand to increase the interaction of enterprise technologies, and the business culture that enable companies to use web 2.0 technologies successfully (Enterprise 2.0 conference, 2009). The objective of Enterprise 2.0 is to allow employees, customers and suppliers or partners of a company to communicate and share their knowledge.

Enterprise 2.0 has common features called SLATES by McAfee (2006). SLATES assist people with very different backgrounds and thoughts to communicate productively, share knowledge and create content that can be improved over time. According to McAfee (2006), acronym SLATES refer to:

Search**:** it provides mechanisms for discovering knowledge through the browsing of websites on internet/intranet rather than a database or repository. So as to make it easier for its users to find what they are searching for through a keyword search. This makes these platforms powerful information gathering tools.

Links**:** is one of the key indicators that guide people to valuable and important content. Links are used to find additional and needed knowledge such as the frequency of linkage

use. These links ensure emergent structure to online content. On the internet, links work well but in an intranet users often have to build links in order to increase the values of search.

Authoring**:** it enables knowledge workers to share their opinions with others. It makes the user able to update content across platforms, which leads to an expanded social workgroup of many rather than a few web authors. In wikis, the content is iterative which means a user may alter, extend, undo and redo another author's work. While in blogs, the content is cumulative which means posts and comments of individuals build up over time.

Tags: it presents an alternative navigational experience exploiting unhierarchical categorisation of intranet content. In other words, knowledge workers make a categorization of content by adding a simple one word description (collaborative tagging) to facilitate searching without dependencies on pre-made categories. So it refers to folksonomies rather than taxonomies.

Extensions: it exploits collaborative intelligence and recommends to knowledge workers relevant content by enabling easily extended fields of knowledge using match pattern of topics and send people only to sites they are interested in such as StumpleUpon.

Signals: they automatically alert knowledge workers when new, available and relevant content of interest is created. Signals can be email alerts but RSS allows employees to use the information in much more efficient manner.

Table 2.1: the difference between E1.0 and E2.0 (Enterprise 2.0 conference, 2009)

Enterprise 1.0	Enterprise 2.0
Hierarchy	Flat Organization
Friction	Ease of Organization Flow
Bureaucracy	Agility
Inflexibility	Flexibility
IT-Driven Technology/ Lack of User Control	User-Driven Technology
Top Down	Bottom Up
Centralized	Distributed
Teams are in one building/one time zone	Teams are global
Silos and Boundaries	Fuzzy boundaries, open borders
Need to know	Transparency
Information systems are structured and dictated	Information systems are emergent
Taxonomies	Folksonomies
Overly complex	Simple
Closed/Proprietary standards	Open
Scheduled	On Demand
Long time-to-market cycles	Short time-to-market cycles

2.4 KM in the Context of Web 2.0: KM 2.0

Companies are becoming interested in web 2.0 technologies such as blogs, wikis and social networking with their increasingly benefits for supporting people participation and sharing knowledge among knowledge workers and therefore many organizations need to integrate web 2.0 with organizational business structure. Since online communities or web 2.0 technologies allow people to share popular interest and have guidelines (policies) for their interaction (Preece, 2000), online communities provide social interaction through the computer systems. Organizations benefit from getting knowledge created by a large community of users and this knowledge can leverage organization's services, products and technologies. Thus, web 2.0 technologies have revitalized the field of knowledge management and shifted it from traditional KM into KM 2.0.

Traditional Knowledge Management (KM) is a systematic and active management of expertise, information and knowledge that is used to identify, gather, organize, transfer, share organizational knowledge into centralized data repositories in order to improve performance, create competitive advantages and generate innovations (Lee and Lan, 2007; Turban et al., 2008).

The sources of traditional KM could be generated by knowledge workers on both intra-organizational scope and Inter-organizational. Intra-organizational scope refers to internal business functions which are management & administration, human resources, finance & accounts, purchase & procurement, and sales & marketing. In contrast, extra-organizational scope focuses on external business functions like customer relationship management (CRM), supplier relationship management (SRM), supply and chain management (SCM) (Lan and Unhelkar 2005).

Knowledge workers share information between each other and chain it together to obtain valuable knowledge. However, there is a lack of knowledge participation that is gathered from the business functions into isolated knowledge repositories (Lee and Lan, 2007).

In traditional KM, the computer systems are not integrated with other information systems e.g. intranet applications are separate from other IS such as ERP. Furthermore, there is a lack of integration among web-based applications. For that reason, various critical factors resulted such as low effectiveness because of different means of browsing; lack of efficiency because of duplication of some components and a lack of flexibility in new application development because all components have to be reconstructed each time (Corso, Martini and Pesoli, 2008).

The lack of integration between IS leads to a gap between people and computer systems so these systems cannot meet the needs of people (the detail in section 2.5). So, traditional KM is insufficient in organizational processes. KM systems are also highly structured (Mader, 2007; Tapscott and Williams, 2006). In other words, knowledge workers focus is restricted to codified and embedded knowledge in organizational systems (explicit knowledge) which represent an organizational resource and they ignore human or social knowledge (implicit knowledge). Moreover, KM systems are difficult to use and adapt and that is why employees are restricted in their usage of these structured systems. Due to this, the numbers of employees that have used the KM systems is reduced and it has a negative effect on their support for knowledge provision increase (Hideo and Shinichi, 2007; Mader, 2007; Tapscott and Williams, 2006).

As the new era of web 2.0 appeared with the concept of "collective intelligence", a second phase of KM resulted including web 2.0 technologies like blog, wiki and SNS. Traditional KM became less common (Hideo and Shinichi, 2007) as organizations integrating web 2.0 with its business, moved away from structured commands and control systems and towards interaction and teamwork (McAfee, 2009; Enterprise 2.0 conference, 2009). Currently, knowledge workers aim to merge the benefits of traditional KM with the following characteristics of web 2.0 in what is called KM 2.0 (Lee and Lan, 2007). The major objective of the merging is to develop the knowledge via web 2.0.

> *"**Contribution**: every Internet user is allowed to generate their interesting information on Internet.*
>
> ***Sharing**: knowledge contents are freely available to others. Secured mechanisms may be enforced to enable the knowledge sharing amongst legitimate members within specific communities.*
>
> ***Collaboration**: knowledge contents are created and maintained collaboratively by knowledge providers. Internet users participating in the knowledge contents can have conversations as a kind of social interaction.*
>
> ***Dynamic:** knowledge contents are updated constantly to reflect the changing environment and situation.*
>
> ***Reliance:** knowledge contribution should be based on trust between knowledge providers and domain experts"* (Lee and Lan, 2007, p.50).

The purpose of web 2.0 is to increase the collective intelligence of the participants. Collective intelligence is the knowledge distributed within groups and process of managing knowledge (Hideo and Shinichi, 2007; Hoegg et al., 2006). Collective intelligence represents the core of KM 2.0 and its knowledge extracted from web 2.0 tools, knowledge database and job applications. As a result, collective intelligence represents the knowledge of all participants and continuously adapts the need of environment or opinion leadership (Hideo and Shinichi, 2007) (see figure 2.1).

Hideo and Shinichi (2007) defined KM 2.0 as *"a model that places collective intelligence at its core and promotes its use by accelerating the distribution of information."* (Hideo and Shinichi, 2007, p. 52)

There are four processes that contribute to build the collective intelligence. First, disclosure means opening the information sources that originate from different sources for employees. Second, linking means a linkage between information/knowledge and its sources. Third, selection means determining the important information by computing its value. Finally, evaluation means ranking a value of selected information or knowledge according to its purposes. (Hideo and Shinchi, 2007)
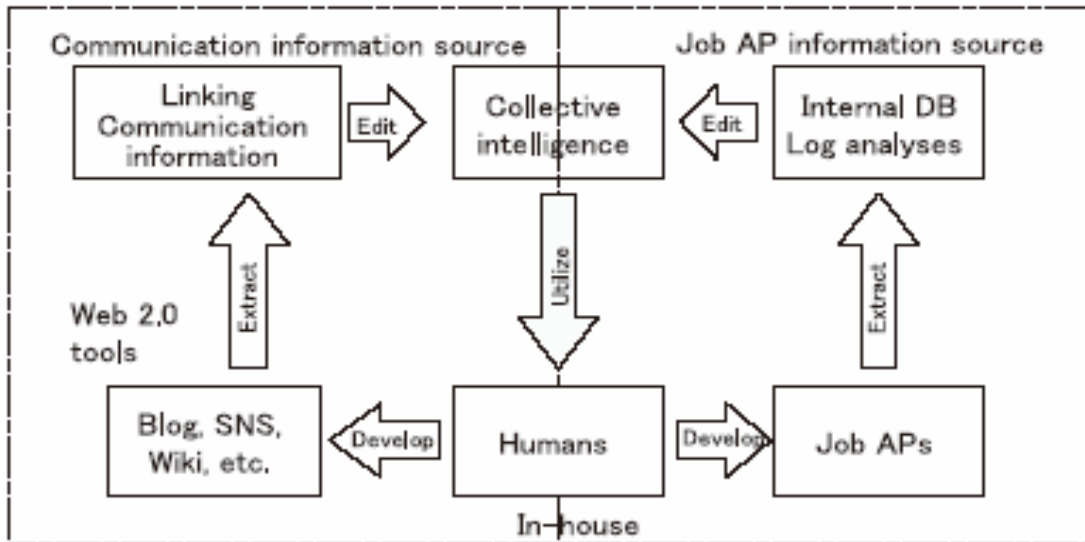
Figure 2.1: KM 2.0 model (Hideo and Shinchi, 2007)

2.5 Socio-Technical Knowledge Management Perspectives

In the previous section, it was mentioned that traditional KM has a gap between systems and people because of the lack of integration between information systems. The next paragraphs will explain more about the socio-technical gap and how to reduce this gap.

Knowledge management literature has concentrated on disconnected organizational systems views of people-centred and technology-centred strategies (Mentzas et al., 2001). The fragmentation perceptions are called the socio-technical gap. As shown in figure 2.2, the socio-technical gap occurs when software and hardware provide support for the technical subsystems while social subsystems remain virtually unsupported (Patrick and Dotsika, 2007). The reason behind socio-technical gap is the distinction between explicit and tacit knowledge (Bhatt, Gupta and Kitchens, 2005).
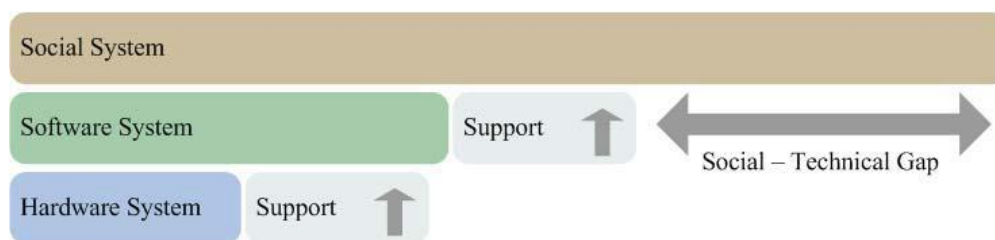
Figure 2.2: Socio-technical gap (adapted from Patrick and Dotsika, 2007).

Explicit knowledge refers to codified and documented knowledge; it should be managed by technology-oriented approaches while tacit knowledge (know-how) is inside the human brains (people's thought and belief) and should be managed by people oriented actions (Bhatt, Gupta and Kitchens, 2005). As shown in figure 2.2, social requirements are ignored and it is difficult to fit in between technical and social requirements.

Since enterprise knowledge management aims to create an environment which encourages the active social interaction between participants and promotes innovations, this perspective suggests to integrate both updated separated social and technical organizational system views. According to Lytras and Pouloudi (2006, p.64), "Knowledge management as a socio-technical phenomenon where the basic social constructs such as person, team and organization require support from Information and Communication Technology (ICT) applications".

A socio-technical approach is applied to study the relationship between social and technical structure of an organization (Cartelli, 2007). In order to fit socio-technical in small knowledge intensive companies, an OrganiK approach is proposed. This approach advances creation, sharing information between knowledge workers in an organization's environment. The following major components of the proposed OrganiK knowledge management framework are shown in figure 2.3. (Dimitris et al., 2008)

- A people centred knowledge management concentrates on social processes, organizational structure and ad-hoc work practices.

- A technology centered knowledge management concentrates on integration of social enterprise applications (blogs, wikis, social networking and RSS) with semantic technologies (ontology-based annotation, semantic text analysis, logic-based reasoning).
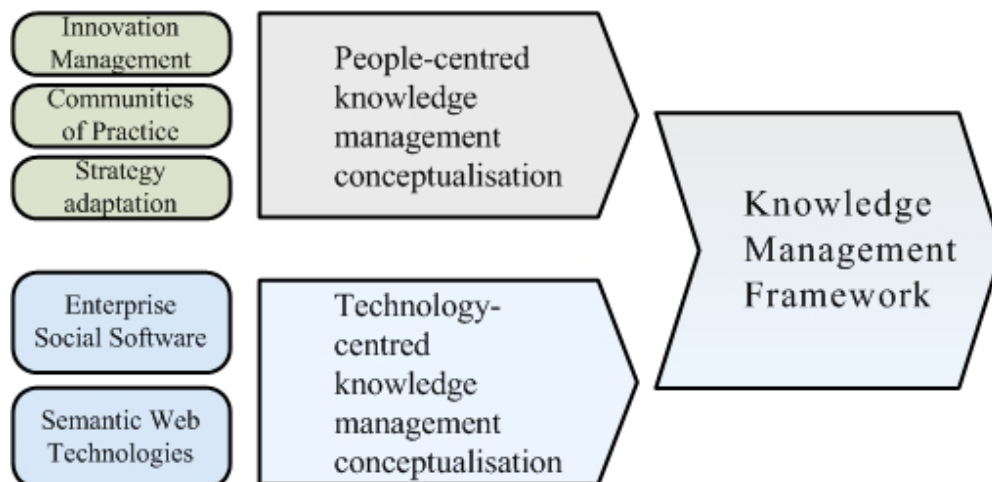
Figure 2.3: The proposed OrganiK knowledge management framework (adapted from Dimitris et al., 2008).

In order to reduce the socio-technical gap between knowledge workers and knowledge management systems, integrating Enterprise 2.0 and Semantic Web technologies is necessary. Enterprise 2.0 contains SLATES (see section 2.3) and the use of Semantic Web technologies involves the key functions that are mentioned below. Integrating web 2.0 applications (blogs, wikis, social networking and RSS) with semantic information enables the aggregated use of Folksonomies and ad-hoc tagging with thesauri and shared ontologies (see figure 2.4). Thus, Enterprise 2.0 integrates the culture into the technology to bloom potential success within companies.

*"**Semantic knowledge representation**: representing knowledge in a formal, machine understandable manner.*

***Semantic resource annotation:** annotating knowledge artefacts and other resources by reference to concepts defined in an ontological model.*

***Semantic inference:** performing automated logic-based reasoning to infer new, implicit knowledge based on what has been already asserted in an explicit manner.*

***Semantic search and discovery:** using ontological terms to describe a search query and rely on logic-based reasoning to derive the matching results".* (Dimitris et al., 2008, p. 49)
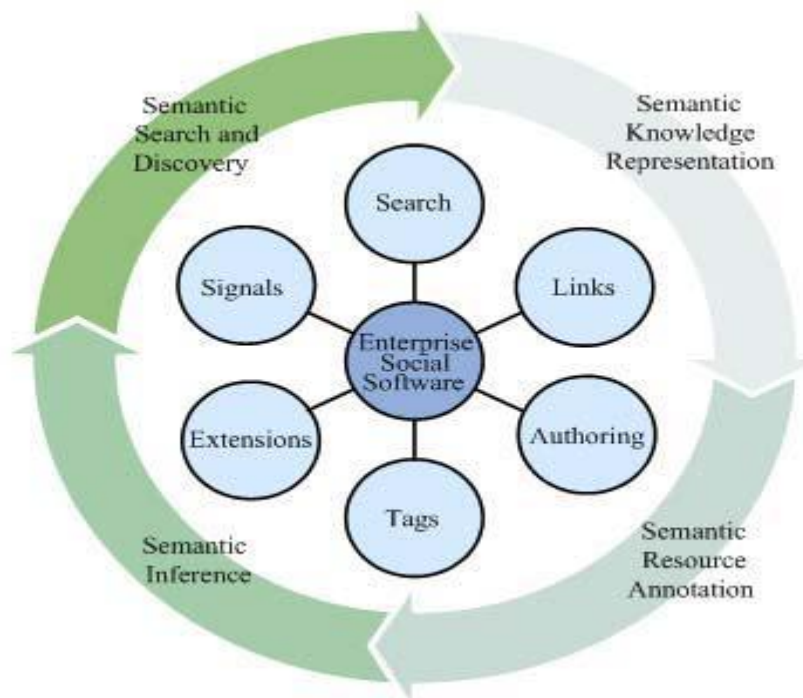
Figure 2.4: Integrating SLATES with machine processable semantics (adapted from Dimitris et al., 2008).

2.6 The Enterprise 2.0 Bull's-Eye Model of Tie Strength

Many managers do not know which Enterprise 2.0 technologies they should pick up and when each technology should be used as well as some of the managers think that ESSPs are all the same and do the same things or have the same effects in companies. The intersection of "tie strength" between people and ESSPs show that emergent social software platforms (ESSPs) come in different forms and can be used in different ways (McAfee, 2009). Enterprise 2.0 Bull's- eye lets the managers select the right technology for the right task in order to get the benefits of Enterprise 2.0.

As you see in figure 2.5, tie strength is represented in the Bull's-eye diagram. From the perspective of the focal knowledge worker, bull's-eye diagram contains four rings or levels starting from the first level of strongly tied colleagues and continuing to the second level of

weakly tied colleagues and then the third level of potential tied colleagues and ending with the fourth level of untied people (McAfee, 2009).

Relative amounts of different types of ties for a prototypical knowledge worker

None

Potential

Weak

Strong

Not to scale
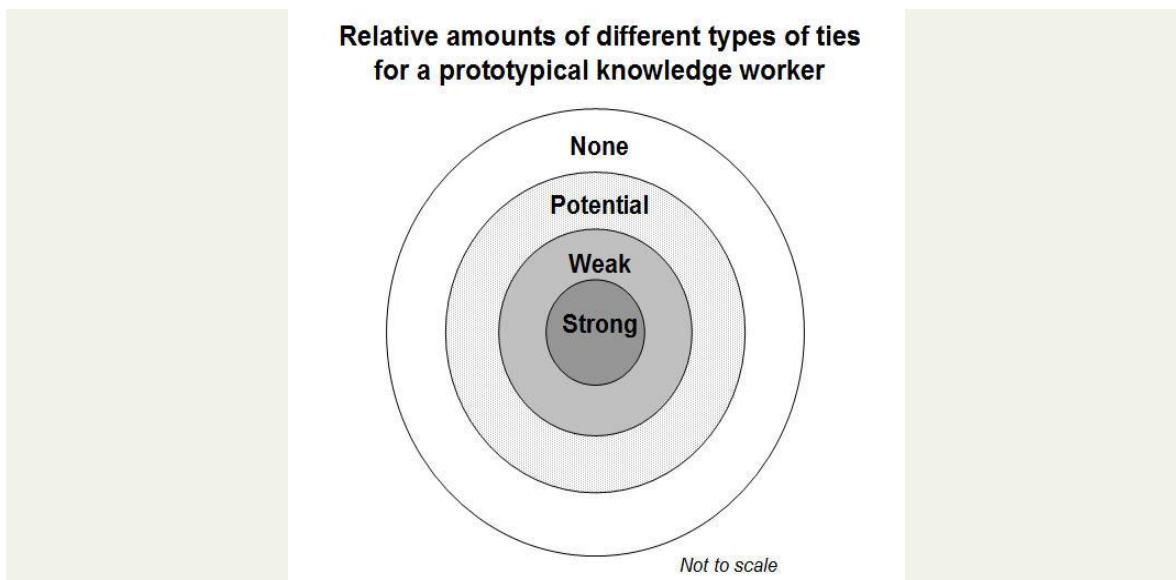
Figure 2.5: Enterprise 2.0 Bull's eye diagram (McAfee, 2009)

There is a small group of close collaborators with whom the knowledge worker has strong professional ties (McAfee, 2009). Further, there is a larger group of people with whom the knowledge worker interacts periodically. So those people are weakly tied colleagues of the knowledge worker (Granovetter, 1983).

In this respect, Granovetter (1983) proposed that strong ties tend to bring similar people to each other. So, the information obtained through such a network tie is redundant. For that reason the network is not a channel for innovation. In contrast, weak ties connect people from different parts of systems and let them access to new information and resources beyond the information that is available in their own social circle and therefore weak tie is powerful to construct large networks of acquaintances. As a conclusion, Granovetter (1983) proposed that strong tie is more important in understanding network-based phenomena than a weak tie.

Beyond those groups, there is still a larger group to whom the knowledge worker does not know because there is no network between them. In other words, the structural hole between the focal knowledge worker and these people has not been spanned by a person unless there is network to connect them. The interpersonal ties are only potential not actual. In order to bring people to each other, weak ties have to be maintained and exploited; potential ties should be converted into actual ties and strong ties should be made broader and more useful by embracing weak and potential ties.

Since email and instant messages can easily be missed if they are used to maintain and exploit weak ties and convert potential ties into actual ones, these channels are replaced by platforms of Enterprise 2.0 technologies. McAfee (2009) suggested using wikis for strongly ties colleagues, SNS for weakly ties collaborators, a blogosphere for converting potential ties into actual ones and prediction markets for united people.

As the last ring of the Bull's-eye diagram is using prediction market according to McAfee (2009) and my focus is limited to the wiki, SNS and blog, this study is restricted to the first three rings.

New tools for strongly tied colleagues

The classic technologies that are used to connect people with each other at the strong ties level face problems. As an example, the use of email to attach documents addressed for knowledge workers faces the two challenges of version control and simultaneous editing (McAfee, 2009).

Version control happens when different versions of the same document are attached from different sender's computers and it is difficult to recognize which version is correct or the latest one. Simultaneous editing refers to contrastive versions of one document and is the result when collaborators are each editing their own copies of the document simultaneously. In this sense, the incompatible versions must be reconciled. (McAfee, 2009)

The wiki is used to avoid these problems, as the wiki is a sufficient tool to support the strong tied colleagues. It solves the version control problem by saving all the versions of the document that are attached from different contributors into a shared knowledge repository. In this way, the knowledge workers will be able to distinguish which version is correct. Regarding simultaneous editing, Media Wiki (the wiki software beyond Wikipedia) warns the user about ingoing editing's by other users. Wiki can be used by knowledge workers to generate, share, update and edit knowledge. Thus, wiki lets knowledge workers to do their work better, faster and with more agility than the previous tools. (McAfee, 2009)

New tools for weakly tied colleagues

Social software networking (SNS) like Facebook is a powerful tool for keeping knowledge workers in touch with a large network of colleagues and update their friends every time (McAfee, 2009; Boyd and Ellison, 2007).

Facebook has some features that make it a valuable tool to connect weakly tied people. First, it allows its users to create list of contacts called friends and update them all the time. The users can also add the friend of their friends. In this sense, the users accumulate large numbers of weak ties (McAfee, 2009; Boyd and Ellison, 2007). Facebook serves as an address book since its members can search their list of friends to find a specific person and then go to his or her profile to find more contact details. The second feature is that Facebook has a small text box where its members write notes and comments and share them with their friends. In short, Facebook lets its members not just post their updates on the network but also receive links, photos and updates from other participants (McAfee, 2009).

Since Facebook is a global social network website that allows its users to connect with each other, add friends, and update their personal profiles, companies use Facebook in order to create a stronger and more social environment. So, Facebook allows the knowledge worker to share knowledge globally with people that share the same interest. The knowledge workers can use Facebook to post their photos, videos and links to online

content and they can also ask people for assistance in different fields (McAfee, 2009; Dawn, 2009)

If you do not know how to harness Facebook in your company, Dawn (2009) pointed to some ways that help people to engage Facebook. The best way to understand how to use Facebook in your company is to learn from some people in your company who are engaged with Facebook as individuals. The use of Facebook simply starts by creating a personal account, entering your personal information and add friends that share the same interest. After understanding how to be on Facebook as individual, you could create a company page that lets you provide information about your company like video, calendar, conversation, etc. Then, people choose to become "fans" of your company (Dawn, 2009; Newman and Thomas, 2009). After that, you can create groups about any topic in the same way that the Online Community Roundtable events in San Francisco are organized using a Facebook group (Dawn, 2009).

If employees do not use the site's privacy tools, all information that they share with their colleagues will be visible to all Facebook participants. Many employees do not want their information to be visible on the Internet. So, it is important that employees should be educated about the site's privacy tools and how they create slices of their profiles so that they share the right information with the right people (McAfee, 2009).

New tools for converting potential ties

There are experienced people available too, whom the knowledge worker does not know. The potential ties should be converted into actual ones through allowing the prototypical knowledge workers to find new experienced people who have valuable information, share the same interest and they have solved similar problems. Furthermore, these people can guide the knowledge worker about products, services, competitors etc (McAfee, 2009).

The blog is a powerful tool for this level because the blog has some features that enable it to span the holes between the knowledge worker and other potential people. First of all, blog shares knowledge by linking contents to each other. It is not only valuable by its content alone, but also by its capability of linking people to each other. The content of the blogs are organized into posts and articles which are easy to reach (McAfee, 2009; Holtz and Demopoulos, 2006).

Second, the blogs' content is frequently updated and new posts are added daily. In addition blog is visible and does not die or expire so the worker can see any blog at any time. Since blogs are interlinked and workers can directly be linked to interesting post, knowledge worker can write whatever he/she wants to write and get knowledge in form of feedbacks from other people. (McAfee, 2009)

Third, blogs help companies to build their smart business smartly by displaying their products on a website and writing about them, so they get an opportunity to create a good relationship with their weakly tied customers. The companies can perform search advertising, email marketing and create online public relations. Intranet can be improved if it is interlinked and has an agile search engine similar to Google's. Since blogs have these properties, blog is valuable tool to be employed by knowledge workers (McAfee, 2009).

Wiki, Blog and SNS are not restricted to their specific tie rings but they can be valuable in other rings as well for example, wikis can be used to convert the potential ties into actual ones. Thus, strength ties showed that the tools are not necessary the same or have the same effect within companies. But instead they are powerful in different ways (McAfee, 2009).

2.7 The Benefits of Enterprise 2.0

After understanding the bull's eye model of tie strength, it is also important for business decision makers to understand the new benefits that are derived from Enterprise 2.0 at different levels of tie strength. The benefits are group editing, authoring, broadcast search, network formation and maintenance, collective intelligence and self-organization (McAfee, 2009).

Group editing

This is how a variety of people interacts and shares their knowledge as a group. Group editing is powerful for strongly tied colleagues to ensure that the knowledge is not shared with people outside the group (from outer rings of the bull's eye). So, the group editing is necessary for security and confidentiality reasons and works well as long as each member of the group has a same goal. However, the people outside the company cannot search or benefit from internal knowledge and they cannot even contribute any useful knowledge into internal knowledge since the knowledge can only be edited by and remains visible only to internal people. (McAfee, 2009)

Many organizations have done group editing, and found this to be a smart and valuable way to share the right information with the right people. One of the known and earliest examples was Eureka system which shared knowledge among Xerox repair technicians but not with suppliers, customers or Xerox sellers (Bobrow and Whalen, 2002). Currently, group editing ESSPs environment can also be used to share knowledge through a community of practice.

Authoring

People are able to publish their information that they know online in order to be visible by others. Authoring allows people to share updates through SNS, posting photos, videos and podcasts, and writing blogs. Knowledge workers can share knowledge and expertise for enterprise purposes. KM 2.0 has a dynamic central repository that contains what knowledge workers know and members can of course add, consume and edit the content as well as link to content of other authors. (McAfee, 2009)

One of the best examples is the Canadian real estate Development Company Intrawest Placemaking, they used a software for authoring called ThoughtFarmer (developed by Open Road Communications) in April 2006. This software allowed the employees to create blogs and other content (McAfee, 2009).

With ThoughtFarmer it is easy to share knowledge, eliminates distortion of knowledge and increase employees' engagement (add, delete, edit, upload pictures, etc). It makes it possible for employees to trust them and therefore the employees trust the company. It also allows the users to fix errors immediately (McGrath, 2009). ThoughtFarmer uses

something called "Place", which means each contribution by any employee has the employee's name, linked to his Place so employees can link to the others' place and learn about them (McAfee, 2009).

Broadcast search

In contrast to authoring, people publish information that they do not know. A broadcast search is used to post questions for getting answers. As an example, research groups of large organizations use Innocentive to publish scientific problems in hopes to get answers from problem solvers (McAfee, 2009). It is found that 29.5 percent of 166 problems posted to Innocentive had been solved (Lakhani et al., 2007).

Network formation and maintenance

ESSPs like Facebook and LinkedIn are popular and provide the benefit of network formation and maintenance since they are collections of information and their authors are declared on the intranet so the searcher can identify experienced and smart people based on their records. Then, the searcher can contact them. In this way, the searcher converts potential ties into actual ones. In other words, the social software platforms such as SNS and wikis help people to span structural holes and share their knowledge by collaborating with each other. (McAfee, 2009)

Facebook and other social networking help people to maintain and update these networks, as well as they can provide updates about themselves and podcast the updates automatically and immediately to strong and weak ties. In this sense, it will be easy for knowledge workers to ask their networks questions and collect answers. (McAfee, 2009)

Collective intelligence

It refers to use of Enterprise 2.0 technologies like prediction market by knowledge workers to capture explicit and implicit knowledge in order to develop product or make their decisions. McAfee (2009) expects that prediction market will be more used in the future. Collective intelligence is used also by websites to vote, for example some companies use collective intelligence to know which products are interested.

Self-Organization

According to McAfee (2009), self-organization is the most benefit from social networking software and other ESSPs. Self-organization means "the ability of users to build valuable communities and resources and shape them over time without having to rely on guidance from any center or headquarters" (McAfee, 2009, p.140).

Enterprise 2.0 aspects changed the nature of the work from hierarchy where managers define rules and people follow the predefined rules and plans of the organization (taxonomies) into social environment where people organize the resources based on their self interest (folksonomies).

Within the classic enterprises, people in hierarchy system refer to authority, expertise and roles for further innovation in Research and Development (R&D) department where the people are experienced and educated. In contrast, Enterprise 2.0 allows the roles; expertise

and authority to be emerged rather than specified. ESSPs let people to find expertise everywhere at anytime as they interact with each other and spread their expertise without following predefined decisions. So, organizations that integrate web 2.0 tools into their business structure will see self-organization as a deep advantage instead of risk. (McAfee, 2009)

2.8 Enterprise 2.0: Challenges

Besides the benefits of Enterprise 2.0, McAfee (2009) showed that managers have concerns around Enterprise 2.0 technologies. These concerns fall into two categories: concerns that managers have before integrating web 2.0 into their business and this category is called red herring. On the other hand, there are concerns that managers think about after integrating web 2.0 technologies into their business and this category is called long haul. This section will clarify these concerns and refers to how technologies, communities and business leaders create a balance between accessibility and control.

Red herring: managers are afraid of losing control if they use Enterprise 2.0 technologies because these technologies are open and allow freely contribution to information platforms. This hinders managers from integrating web 2.0 technologies into their business. However, these concerns are not serious in comparison with the benefits of Enterprise 2.0. For that reason, McAfee (2009) called them red herring. Red herring concerns are:

Inappropriate behavior and content: some people disturb the company by writing irrelevant or offensive online information which is unsuitable with the company's goal and does not benefit it. In this case, companies should do the following: First, it is a norm that all people who contribute on the intranet should reveal their names so that anyone disturbs the company with irrelevant or offensive information will be identified by other people. Second, self-policing has to make its role in avoiding misbehavior. This means that the communities of the company should react when they notice misbehaving by some members. The reactions often are achieved by informal leaders who provide corrections for offensive or irrelevant messages. Third, awareness and reaction of formal readers can also change some unsuitable behavior. Fourth, many people have experiences and know how to use the platforms to meet the organizational goals (McAfee, 2009).

Inaccurate information: some inaccurate information or answers to questions damage the reputation of the company. In this sense, self-policing can determine and correct the inaccurate information.

Embarrassing information: customers might write online negative feedback about company's products or services. However, the negative feedbacks have not only disadvantages but also advantages. One advantage is that negative feedbacks can lead companies to develop their products and services. Furthermore, the website of the company that displays both advertisements and negative opinions makes people trust the positive ones.

Stealing information: most of companies do not want to publish their knowledge on online Enterprise 2.0 technologies because they are afraid that some people (either outside or inside the company) may steal their knowledge through copying it (McAfee, 2009; Morley,

2008). However, this knowledge could be valuable outside companies. If managers measure the benefits of Enterprise 2.0 and compare them with red herring risks, they will see that red herring risks are not very dangerous in comparison with the benefits of Enterprise 2.0. McAfee (2009) believes that benefits of Enterprise 2.0 overweigh the above risks.

Long Haul: Once companies integrate web 2.0 technologies into their businesses, people who are responsible for deploying these technologies concern about how they persuade other employees to use these new technologies so that they increase the number of intranet users that contribute to organization's ESSPs technologies (McAfee, 2009). It is a hard task to change the behavior of businesses leaders who are used to use the traditional channels where they do not discuss their ideas and business matters with people in order to avoid the collision in the opinions (McAfee, 2009; Newman and Thomas, 2009). Based on theory-in-use, this behavior leads business leaders to work and remain in one direction (unilateral control) in order to win (Kofman, 2003; McAfee, 2006). This means that the behavior of these business leaders is not open to change. The theory helps to explain why many corporate empowerments fail or disappoint. As a result, some companies deploy Enterprise 2.0 technologies but there is no one uses them or even if they use them, they cannot reach their benefits. (McAfee, 2009)

Enterprise 2.0 technologies are powerful technologies, but their deployment and success come slowly because Enterprise 2.0 is puzzled and requires both behavioral and technological changes (McAfee, 2009). Gourville (2006) called the new products that require behavioral and technological change as long haul. Thus, Enterprise 2.0 is a long haul (McAfee, 2009).

To solve this problem, businesses leaders or managers have to follow espoused theory that does encourage and stimulate the use of the new technologies in order to create platforms, improvement and development which require managers to reject the unilateral control, be social and open minded managers instead of selfish, work bottom up instead of top down and allow others to participate in discussion and exchange views in order to base them on most valid knowledge (Kofman, 2003; McAfee, 2006). However, the younger employees are more familiar with the new social tools than the older people. So, the champions who are mostly younger employees demonstrate and encourage the new social tools, as well as they explain the goals and the opportunities of Enterprise 2.0. The champions should also communicate the older people and educate the users of Enterprise 2.0 tools about how to select the appropriate technology and use it properly in order to meet the goal of the company and get the opportunities of Enterprise 2.0. (McAfee, 2009)

2.9 Summary of Literature Review

All in all, section 2.1, 2.2 and 2.3 have provided us with understanding about the most buzz terms including web 2.0 and its technologies like blog, wiki and SNS; Social media and Enterprise 2.0. Also the literature referred to the differences between Enterprise 2.0 and Enterprise 1.0 in table 2.1. Since web 2.0 transformed the management of companies from the first Era into the second Era, section 2.4 showed how web 2.0 affected KM and clarified KM 2.0 term, as well as the differences between the traditional KM and KM 2.0.

As the traditional KM has a gap between people and technologies, the OrganiK knowledge management framework is used to reduce the socio-technical gap through integrating Enterprise 2.0 technologies with the semantic web. Since Enterprise 2.0 contains SLATES which is acronym for the common features of Enterprise 2.0 like **S**earch, **L**inks, **A**uthoring, **T**ags, **E**xtensions and **S**ignals and the semantic web has functions like semantic knowledge representation, semantic resource annotation, semantic inference as well as semantic search and discovery, the integration of Enterprise 2.0 with the semantic web enables the aggregated use of Folksonomies and ad-hoc tagging with the thesauri and shared ontologies (see section 2.5). Thus, the KM of Enterprise 2.0 (KM 2.0) manages the IT in a social and consistent manner especially in the areas of socio-technical gap.

McAfee (2009) developed Enterprise 2.0 Bull's eyes model that showed the use of ESSPs in different levels. Wiki is used with strongly tied colleagues, SNS like Facebook is used with weakly tied colleagues and blogosphere is used with potential tied colleagues. With this model, McAfee (2009) stressed that ESSPs tools are different and they are used for different tasks (see section 2.6).

The literature showed that there are positive and negative consequences behind using ESSPs. The positive consequences refer to some significant benefits of Enterprise 2.0 (see section 2.7) while the negative consequences refer to Enterprise 2.0 challenges (see section 2.8). In order to investigate the uses of ESSPs, Enterprise Bull's eyes model is used as a basic model of my future analysis.

Table 2.2 shows the main theoretical concepts (web 2.0 technologies, Enterprise 2.0, KM 2.0, Enterprise 2.0 Bull's-Eye model of Tie Strength) in relation to the research questions that are mentioned in the problem area and then summarizes the literature review which clarifies these concepts.

Table 2.2: Summary of the literature review

Research Questions	Theoretical Concepts	Literature Review
How are global companies using web 2.0 technologies?	Web 2.0 technologies	• Web 2.0 is a second phase in web evolution referring to a platform whereby users are able to create applications and content on the Internet in a participatory and collaborative way (O'Reilly, 2005). • Blog, wiki and SNS are the most common web 2.0 technologies that are used in companies (McKinsey, 2009). • Social media is often defined by web 2.0 technologies that are used for social interaction and allow the creation and exchange of UCC (Kaplan and Haenlein, 2010). • UCC refers to the social sites and its content that are created by the end users. (Kaplan and Haenlein, 2010).
	Enterprise 2.0 (using web 2.0 in companies)	• It is the use of ESSPs (Emergent Social Software Platforms) within and between companies to meet their goals (McAfee, 2009). • ESSPs are web 2.0 sites such as wiki, blog, Facebook, etc (McAfee, 2009). • Table 2.1 showed the differences between Enterprise 2.0 (enterprises that embrace web 2.0) and Enterprise 1.0 (enterprises that embrace web 1.0). (Enterprise 2.0 conference, 2009).
	KM in the context of Web 2.0: KM 2.0	• Companies use web 2.0 technologies to manage their IT in a social manner especially in the area of socio-technical gap through integrating web 2.0 technologies with the semantic web (see OrganiK framework in Fig. 2.3 that adapted from Dimitris et al., 2008) and to avoid the classic KM (KM of Enterprise 1.0) which is hierarchal, taxonomy, imposed (McAfee, 2009; Enterprise 2.0 conference, 2009) and involves a socio-technical gap (Patrick and Dotsika, 2007). Thus, the KM of Enterprise 2.0 (KM 2.0) integrates the culture into the technology to share knowledge with employees, customers and suppliers and bloom a potential success within companies.
	Enterprise 2.0 Bull's-Eye model of Tie Strength.	• The intersection of "tie strength between people and web 2.0 technologies or ESSPs show ESSPs come in different forms and can be used at different levels for different purposes. Wiki is used at the strong ties level to support the strongly ties colleagues, SNS is used at the weak ties level to connect weakly ties people and blog is used at potential level to convert the potential ties into actual ones (McAfee, 2009) (see section 2.6). Enterprise 2.0 Bull's-Eye model lets the managers select the right technology for the right task in order to get the benefits of Enterprise 2.0. • The benefits that are derived from Enterprise 2.0 are Group Editing, Authoring, Broadcast Search, Network Formation and Maintenance, Collective Intelligence and Self-Organization (McAfee, 2009) (see section 2.7).
What are challenges behind using Enterprise 2.0 technologies?	Enterprise 2.0: Challenges	Besides the benefits of Enterprise 2.0 technologies, there are some challenges. These challenges fall into two categories: red herring and long haul.
	Red herring	Managers are afraid of losing control if they use web 2.0 technologies since these technologies are peer to peer, social and allow freely contribution to information platforms. However, these risks are not serious in comparison with the benefits of Enterprise 2.0 technologies and can be avoided (McAfee, 2009) (see section 2.8, p 21).
	Long haul	People who are responsible for deploying web 2.0 technologies concern about how they persuade other employees to use these technologies so that they increase the number of intranet users (McAfee, 2009) (see section 2.8, p 22).

Research Methodology

In this chapter, the methods and the practical approach of the research will be described. After having reviewed the theoretical base related with the research and consequence questions, this chapter will proceed with describing and discussing the research approach and the methods that I have used for collecting and analyzing the empirical evidence for this study. Moreover, the chapter will discuss the quality as well as the related ethical issues of the research.

3.1 Research Approach

There are two types of research approaches: quantitative and qualitative (Creswell, 2007). Whereas the purpose of the investigation is to examine the use of web 2.0 tools by different people in their real-life settings at companies (Creswell, 2007), qualitative research was conducted as my research approach. The major strength of employing the qualitative research in this research is to span the topic of Enterprise 2.0 in social and human science and come up in direct contact with experienced users of web 2.0 through interviews. The qualitative research also permits me to explore the research topic and subjects in a detailed view so as to get the deeper understanding of phenomenon, in this context the use of web 2.0 technologies in the global companies as well as the challenges associated with these technologies (Creswell 2007). Also, it is important to explore the activities of the users of these technologies in their natural settings to get a better understanding of the use of web 2.0 in companies.

3.2 Data Collection

The data collection process involves the gathering of research evidences. There are several methods of gathering evidences used in qualitative research to choose from (Yin, 2003). These methods include documents, archival records, interviews, direct observations, participant observation and physical artefacts. The limitation of time for conducting this research project makes it not possible to make available all the methods for data collection. Thus, my research study will involve interviews as a method of data collection.

Interviews

In this research, the interview is employed to collect useful information which enables us to understand the research topic from the subject's point of view, Yin (2003). Since interviews provide a direct conversation between interviewees and a researcher, detailed answers and qualitative data have been captured from the participants' daily life experience in different situations and could be used to address the research question and the consequence question (Creswell, 2007; Kvale 2009; Miles and Huberman, 1994). For this reason, the interviews have been conducted in this research.

There are different types of interviews: first, structured interviews refer to simplest form of interviews with predefined questions about a specific topic. Second, unstructured interviews refer to open discussion interviews without predefined questions. Third, semi

structured interviews are interviews with predetermined questions but the discussion is open and not limited to them because these interviews focus on valuable meanings of interviewees. (Kvale, 2009)

Semi structured interview is employed within this study because it allows open discussions. This means that the semi structured interviews allow the participants to be able to express their perspectives and ideas freely regarding a specific theme without being restricted to the predetermined questions until they ensure that a deep information concerning the problem area have been captured. Thus, semi structured interviews helped me to get easier contact with the interviewees and more flexible way in asking and answering the questions that let information comes up.

I conducted five semi structured interviews with different people at companies like Capgemini, Company X and Volvo-IT since these companies are global companies and have integrated web 2.0 technologies into their business structure for different purposes. Four interviews were face to face interviews and one interview was via email because the interviewee preferred email to face to face interview. All interviewees were experienced in using web 2.0 technologies or ESSPs so they could give me their balanced perspectives about the positive and negative issues of their use. The interviewees were:

- Managers, business leaders and consultants that are using web 2.0 technologies.

- People that are responsible for keeping the security of company's knowledge while using web 2.0 technologies.

Interview guide

After deciding the purpose and the method of data collection, the interviews should be started using an interview guide (Kvale, 2009). The interview guide serves as a driving vehicle for the interviewer as it contains the purpose and themes of the study as well as a sequential description of questions. For this reason, the interview guide has been developed for the empirical findings.

The questions such as "why", "what" and "how" are good to capture descriptive form of interview questions. The research questions tend to be more thematic dimension in the sense that they are built around the theoretical points that is found in the problem area which means that the research questions are more abstract and difficult to be used practical in interviews. For that reason, the research questions are transformed to be more dynamic interview questions. However, the interview questions should be still thematic because they are grouped after the areas which are covered of the research questions. (Kvale, 2009)

The questions that were formulated in interview guide (see Appendix A) are based on the research questions. To make further obvious structure for the research questions, I have divided them into two different themes. The first theme is using web 2.0 technologies in business and the second theme is the challenges of Enterprise 2.0 technologies (see table 3.1).

Table 3.1: Interview questions related to research questions

Research Questions	Theme	Interview Questions
How are global companies using web 2.0 technologies?	• Web 2.0 technologies in business.	• Which of these social media technologies (blogs, Social Network Sites and wikis) are used in the company? • Do you use social media internally or externally? • How do you use blog, wiki and SNS? • How do social media technologies contribute in the progress of the business at the company? • If the Volvo-ITould use social media technologies to link its outsiders into its development projects, could it come up with better ideas for new products and develop these ideas more quickly and cheaply than it today? • What is the difference between social media technologies and common business applications?
What are the challenges behind Enterprise 2.0 technologies?	• Enterprise 2.0: Challenges	• What are the barriers if any to the further success of your web 2.0? • How do you make a balance between accessibility and control? • How do you avoid risks such as inappropriate behavior and content, inaccurate information, embarrassing information and theft?

Data collecting and transcribing

I conducted five interviews. Before every interview, the introduction and the purpose of the thesis, as well as the interview questions had been sent to the interviewees so that they could be prepared for the interviews. The interviewees explained their experiences of using web 2.0 tools and answered different questions that are addressed in the interview guide. These interviews provided me with new knowledge derived from participant' experiences. Video Camera was used to record the face to face interviews under interviewees' permission. There are several reasons behind using the Video Camera for recording the interviews. The first reason is to avoid the natural limitations of our memory which might forget what the interviewees said during the interviews. The second reason is that the recording materials allow more thorough and repeated examination to what the participants said as well as their body language (Kvale, 2009). Each interview should be transcribed into a written text for the later analysis (Kvale, 2009).

3.3 Data Analysis

Data analysis is the process of ordering and organizing data so that useful information can be extracted from it. After transcribing each interview, the immense of the information has been realized. In order to make sense of this information, I read the text of each interview and focused on the meaning, reasons and then organized the information. The analysis of the interviews based on ad hoc meaning technique which starts by organizing the interview texts and then condensing the meanings into forms that help to derive right conclusions. The meaning condensation data makes it easier for me to clarify the necessary parts that are related to the topic and the purpose of the research study and reduce redundant or unnecessary data (Kvale, 2009).

Also, meaning categorization has been employed in this study in order to reduce structured and long transcribed text into tables and be able to compare the different interviews. The first categories are themes that are included in the interview guide. Then, these themes can also include subcategories. The answers of interviewees under one category should be seen so that I could check the similarities and differences between them. Then, meaning interpretations have been provided in the light of literature in order to check whether the interviewee's answers are same the literature or there is new or different information that should be lighted up (Kvale, 2009)

3.4 Research Quality

Lincoln and Guba (1985 cited in Seale 1999) stated that "trustworthiness of a research report lies at the heart of issues conventionally discussed as validity and reliability" (p. 266). This means that the quality of qualitative research focuses on the validity and reliability as criteria that can measure the trustworthiness.

Trustworthiness has four naturalistic concepts: credibility, transferability, dependability and conformability which are correspondent to the traditional concepts: internal validity, external validity, reliability and objectivity (Seale, 1999). The following table clarifies the measures that I employed to secure the quality of the research study.

Table 3.2: Lincoln and Guba's translation of terms (adapted from Seale, 1999)

Conventional inquiry	Naturalistic inquiry	How to achieve
Truth value (internal validity)	Credibility	Member validation (interviewees who are the people that the research has been done on are used as a member validation).
Applicability (external validity)	Transferability	Detailed, thick and rich description of what the interviewees said under each context or setting has been studied.
Consistency (reliability)	Dependability	Auditing (the empirical data has been collected from different people and different companies to achieve the goal of the research study in a single valid version).

1. Credibility (internal validity): This concept ensures the truth and confidence of the research's results and empirical findings by checking whether the empirical findings and results are related to the purpose and research questions of the research study (Lincoln and Guba, 1985 cited in Seale 1999; Norris 1997). The technique that I used to achieve the internal validity is a member validation. The *member validation* focuses on presenting a convincing account using the opinion of people on whom the research has been done, in order to check that the account has correctly incorporated different perspective Seale (1999). Bloor (1997) stated three different types of member validation; the validation of the member taxonomy, the validation of the researchers' analysis by the demonstrated ability of the researcher to pass as a member and the validation of the researcher's analysis by asking collectivity members to judge the adequacy of the researcher's analysis.

However, I validated the analysis by showing the transcripts of the interviews, the description of participants in their situations, the interpretations of the interviews and the final report to the participants so that they confirm them. Since the participants agreed the interpretation of their interviews, the credibility of the research is increased.

2. Transferability (External validity): It refers to the ability of generalization the results and findings (Lincoln and Guba, 1985 cited in Seale 1999). To achieve the purpose of the research study, my empirical data have been collected from different contexts (different levels of people from business leaders and managers to security architect of web 2.0 technologies) at the same or different companies. Then, logical evidence have been provided through detail studying and analyzing what the interviewees said under each context and generalizes the result from one context to other.

3. Reliability (Dependability): It ensures that different observers make the same interpretations of particular object (Seale, 1999). In order to achieve the goal of the research study in a single valid version, the different interpretations are unacceptable. In my research study, the empirical data have been collected from different people and from different departments at the same company and even in different companies in order to ensure the use web 2.0 technologies in companies as well as the challenges that are associated with these technologies.

3.5 Research Ethics

Researchers and ethical regulators have been arguing about many ethical considerations regarding ethical behavior and commitment of researchers. However, they all accept that ethical issues are important (Israel and Hay, 2006). Beauchamp and Childress (1994 cited in Seale 1999) stated that ethic is a generic term for various ways of understanding and examining the moral life.

As the research activities increase and influence the society, ethics have to be taken seriously into account and employ them in the research process because ethics are necessary for creating a comforting situation during the research process. They save participants from any forms of harms or damages as well as ethics protect individuals, communities and environment and help to increase the amount of good in the world (Israel and Hay, 2006). So, the ethics improve my job in communicating with participants and gives advantage for the research. The great need to engage the ethics is to know whether the kind of action that should be taken is right or wrong and to enhance the quality of the research.

Undoubtedly, considering ethical issues while doing the research ensure the authenticity and reliability in order to promote trust and integrity. Israel and Hay (2006) discussed that research need to promote better understandings of the politics and contexts within which ethics are regulated. In my research, I have considered some important ethical issues such as informed consent, confidentiality in order to avoid harm and doing good.

Informed consent

Kvale (2009) and Israel and Hay (2006) argue that, informed consent is the most valuable ethical issues for any research work because most guidelines for ethical research require all participants to understand the reason of their involvement in the research. Thus, the informed consent requires two activities: subjects need to understand the research and to agree voluntarily the nature of research and their participation within the research.

In this sense, I attached a brief introduction and the purpose of my research as well as the interview questions with emails to the subjects so that they understand the purpose of the interview and decide whether they agree to participate or not and prepare themselves in case they agree the participation.

Also, the participants have been informed that the interviews will be recorded in order to refresh my memory and remember what they said for further interpretation and analysis. Moreover, the potential risks and harm of their contributions and benefits that they might gain from this research have been explained to them. All these revealed information to the participants helped them to be more prepared for the interviews, minimized the harm and risks that they were concerned about and increased the trust between the interviewees and me and therefore the interviewees were very eager to participate in the interviews. Thus, the aim of informed consent was achieved.

Confidentiality

"Confidentiality refers to data and to agreements between the researcher and the subject concerning how the data will be managed and who will have access to it." (Sieber, 2001, p. 330). The study has to assure the confidentiality of participants by securing the participants' anonymity and not to reveal their information and attitudes without their permission so that we preserve their privacy as a respect to them.

However, my interviewees had not any problem regarding mentioning their real names and position in the research study except one company which preferred to be anonymous. All interviewees felt proud to tell me their knowledge about using web 2.0 as well as the challenges of Enterprise 2.0 at their companies and did their best efforts to support me with needed knowledge. I had built the trust for the interviewees that I would not reveal any information and try to keep the confidentiality. As I collected the data from the interviewees, the data is stored in the computer protected password to restrict the access to the data (Israel and Hay, 2006). Moreover, the name and detail of one organization will not be available to any other one except the author.

Avoiding Harm and Doing Good

A final guideline is avoiding harm and doing well. It involves protecting participants from any form of harm which could be physical, economic, etc. and its degree depends on the risk and consequences of revealing information (Israel and Hay, 2006). So, our responsibility as researchers is to avoid harm and do well by providing benefits for participants. This brings up the concept of beneficence which is balancing between possible harm and potential benefits for participating in the study (Israel and Hay, 2006; Singer and Vinson, 2002).

Regarding this research, I look forward that the research output will have significant contribution in understanding the use of web 2.0 tools in companies, as well as challenges that companies should reduce while using these tools. Thus, the purpose of this research is to not cause any harm "defeating of interest" (Israel and Hay, 2006, p.96) to anyone but instead, I should add something beneficial to the previously knowledge or complement it in potential way.

3.6 Reduction Bias

Bias arises in the research when the researchers interpret or collect data consciously or unconsciously to meet their own interests which produce erroneous conclusions (Hammersley and Gomm, 1997). People used to be biased in their nature but there are many inspirational determinants for biased manner (Ehrlinger et al., 2005). Many people are biased but they cover their bias when they did not leave any evidence which confirms their bias but instead they accuse other people as biased. Ehrlinger et al. (2005) explained why some people see bias in other more than in themselves. People like to see themselves on desirable attributes which make them do not reveal any truth about their biased data and think that their perspectives of things are pure from influences and therefore they believe that different understandings from their one are influenced and biased.

It is important for any researcher to avoid the erroneous in their conclusion by avoiding being bias. So, I think as a researcher that my bias should be minimized by providing

integration between the research questions and the main topic as well as the purpose of the research which makes me comes up with a good and proper conclusion. To achieve this purpose, I provided a comparison between the literature that have been used to clear up the use of web 2.0 technologies at both individual level and companies' level and the empirical data that have been collected by interviewing experienced people who using web 2.0 tools. Finally, the empirical findings had been showed to the interviewees and peer to peer people in order to confirm the interpretations and analysis and help me to figure out some biases in order to avoid them.

4 Empirical Findings

This chapter presents a condensed presentation of the interviews that have been conducted in order to address the research question and consequence question. The overview of over which companies and interviewees that I was in contact with is given in section 4.1. The empirical findings that are presented in sections 4.2-4.3 illustrate interviewee's natural meaning along with their interpretations and follow the same themes that are mentioned in the interview guide.

4.1 Presenting Companies and Interviewees

Capgemini-Sweden

Capgemini is a global leader in consulting, technology, outsourcing and local professional services. The company has more than 30 branches all over the world. The Collaborative Business Experience is a unique way that the company adopts in working with its clients. Capgemini-Sweden employs approximately 1200 people. The employees are working in teams and are using web 2.0 tools within their daily operations. I interviewed three of them face to face for my investigation. Interviewee 1 and interviewee 3 are employed at Capgemini Technology Services in Malmo. Alternatively, interviewee 2 is employed at Capgemini Consulting Services in Stockholm. What made the interviews interesting is that all of these people have different jobs within different roles in using the web 2.0 tools.

Interviewee 1: Mr. Daniel Terborn is employed in the Technological Services Department as a Practical Leader for the Development and Integration at Capgemini in Malmo. He is also a consultant, working as a system architect developing portals that use web 2.0 technologies (see appendix B).

Interviewee 2: Mr. Johan Bergelin is employed in the Consulting Business and Information Strategy Practice at Capgemini in Stockholm. He uses web 2.0 technologies for innovative IT solutions and leads Capgemini Sweden's work in this area (see appendix C).

Interviewee 3: Mr. Jesper Krakhede is employed in Managing Consulting Security at Capgemini in Malmo. His role in using web 2.0 is both as an ordinary user and as a security architect who is putting requirements on security of social media (see appendix D).

Company X

The other global company in which I did an interview is Company X. Company X is a world leader in food processing and packaging solutions and has offices in almost all countries. Company X-Sweden has 3500 employees that use web 2.0 tools. I interviewed one of them face to face.

Interviewee 4: The interviewee has ten years of professional experience in online communication, continuously moving towards web 2.0 and social media aspects. He is an

active participant in several social networks and he uses social bookmarking and collaborative sites to learn more about his area of expertise. He creates, writes in and reads many blogs and micro-blogs to stay up to date in areas of personal and professional interest.

Volvo-IT

This is also a global Company and part of the Volvo Group. Its employees deliver IT solutions as well as consulting services. Volvo-IT Sweden in Gothenburg has integrated web 2.0 with its business. I did the interview with Volvo-IT via email since they preferred that.

Interviewee 5: Mr. Sven Åke is working with business operational excellence for the Volvo IT sites outside Gothenburg. He was the contact between Caroline Adamsson, Donabedian Vahagn (people that answered the questions together) and me.

Caroline Adamsson who is working with development, implementation and support of collaboration solutions to Volvo IT customers in Sweden also runs the same operations for Volvo IT outside Gothenburg.

Donabedian Vahagn is employed as a manager Content and Collaboration solution center in Lyon, whose mission it is to contribute to the efficiency of their customers globally (mainly Volvo Cars virtual teams) by offering and supporting cost effective collaboration solutions and business value through professional services. (See appendix F).

4.2 Using Web 2.0 Technologies in the Global Companies

This theme will present the use of the blog, wiki and SNS in different companies.

4.2.1 Capgemini

At Capgemini, people are using many different tools internally for their own benefit and externally for marketing purposes. They also use web 2.0 tools for selling solutions. Interviewee 1 provided me with an understanding of the internal use of the blog, wiki and SNS like Yammer while interviewee 2 provided me with an understanding of the external use of the blog and SNS like Facebook and also the internal use of wiki. Interviewee 1 and interviewee 2 described the use of web 2.0 tools within Capgemini so their answers will be presented in this theme. However, interviewee 3 provided me with an understanding of the issue of keeping the security issues of web 2.0 so his answers are presented in Enterprise 2.0 challenges theme.

Blog: is one of web 2.0 tools that are used widely in the company. Capgemini's Consulting Services uses external but not use internal blogging. Interviewee 2 stressed that the blog is used for discussion purposes only as he was describing the use of external blog. An external blog allows the company to build a strong relationship with new people, by letting the employees come into the community and discuss the business matters with a strong voice. They hope that other people will then comment and link the Capgemini and the

company links them. In this way, the company enhances its relationship with others and becomes a part of the community through discussion.

The interviewee focuses on the difference between one way communication and communication by using a blog. In marketing, people communicate through pushing the information and shouting without discussing their ideas with others so this communication is a one way communication. In contrast, the blog allows people to participate, interact and discuss with other people that share the same interests. The main goal behind using the external blog in Capgemini is to find and link new smart people to the company through participation and discussions and then the people comment and link the company. Interviewee 2 confirmed that when he said:

> *"We use blog externally. The purpose of the blog is to come as a part of community and try to discuss in strong voice...it is important to differ between communicating in one way (shouting or just pushing information) which is used in marketing and communicating by discussing with community...so what I hope with blogs is that we discuss and a lot of other smart people come there and comment and they link us and we become a part of community. So, it is important to realize that blog is used for discussion purposes."* (Interviewee 2, Capgemini' Consulting, appendix C).

Capgemini's Technology Services uses blog in a different way than Capgemini's Consulting Services department. Capgemini's Technology Services is using blog both internally and externally. Interviewee 1 mentioned that the internal blog is a perfect media for communicating, sharing knowledge, getting information in regular days and learning about other teams. All teams within the company subscribe to one blog which is full of data and share knowledge between with each other. Team leaders post their assignments, ideas, pictures, knowledge, etc on the blog to team members and the latter read the blog and comment it. The interviewee reflected that this feature is really a success factor for the blog and therefore people have started using the blog instead of email.

> *"The blog is a perfect media for communicating, sharing knowledge and learning about other teams. All teams have one blog full of knowledge and each time we use blog and share knowledge. Team leaders and I am one of them post information on one blog and team members comment it so we can learn more about other teams and that is successful factor for that blog"* (Interviewee 1, Capgemini' Technology; appendix B)

Interviewee 1 mentioned that it is important to realize that blog is a powerful tool if it is used together with RSS because RSS feeds the functionality of blog and notify the users about changes happening in the blogs and it also alert them to bad and good news around the world. The interviewee proceeded, saying that if blog is used without RSS, then the blog is just a useless tool. However, RSS do not always work on the internal or external network and therefore email is used also for notifying the employees about changes that happen in blog.

Furthermore, interviewee 1 mentioned that they use internal KM 2.0 (a platform that is constructed from wiki, blog, forum, shared documents etc) for sharing knowledge inside the company. Interviewee 2 indicated that KM 2.0 is better than the classic KM because the latter has specific taxonomies since the knowledge managers sort the knowledge according to predefined rules. In contrast, KM 2.0 allows people or the community itself to sort the knowledge at the company.

Regarding the external blog, interviewee 1 mentioned that the company uses it to discuss and communicate with new people. The interviewee also said that Capgemini has a perfect CTO's blog (CTO is abbreviation for Chief Technical Officer) which is full of powerful knowledge concerning web 2.0. However, the interviewee was satisfied with using the blog internally but not very satisfied with using blog externally because Capgemini's Technology needs to provide the blog with more information by finding people that have the time to do that.

Interviewee 2 and interviewee 1 indicated that blog is not the best tool for gathering customer's feedbacks and extracting knowledge but instead it is a very potential tool for participation and discussions. Interviewee 2 continued, saying that the Dell Idea Storm is better than blog for collecting customers' feedbacks, ideas and extracting knowledge from within companies. Dell idea storm is a website launched by Dell in 2007. Dell is supported by a collection of web 2.0 technologies that provide a "Storm session" which allow customers to share their ideas about a specific topic. Dell posts a topic and customers submit their ideas and then Dell reviews the ideas and selects the best ones that should develop its services and products.
(Interviewee 2, http://www.ideastorm.com/ideaAbout?pt=About+IdeaStorm)

> *"...for companies, blog is not the best tool for extracting knowledge but instead Dell idea storm is better than blog for achieving this purpose."* (Interviewee 2, Capgemini' Consulting, appendix C).

Wiki: is another powerful web 2.0 tool. Interviewee 1 mentioned that they use two categories of wikis: project wiki and global wiki. Project wiki is used both internally and externally so that anyone of the partners like customers, suppliers, etc can contribute to this wiki and share knowledge, notes and same understanding about a specific project *"With a wiki, all participants can contribute to the information contained within the wiki. It is simply a way to build a common understanding between peers."*(Interviewee 1, Capgemini' Technology, appendix B). The global wiki is not open for partners and clients since it is used internally and only people inside the company can contribute to its knowledge. Interviewee 1 indicated that wiki is a powerful tool for sharing ideas and knowledge about a specific methodology i.e. Capgemini Holland has created a platform (knowledge on wiki) that uses graceful methodologies to improve their projects.

Interviewee 2 confirmed that wiki is a repository of knowledge to which people contribute *"...we have a big repository for storing references to see how we get the knowledge and what is good or bad..."* (Interviewee 2, Capgemini' Consulting, appendix C). Wiki is used to document the best practices and findings like how to implement a project or model, knowledge etc and anyone in the company can add, change or edit knowledge. In this way, Capgemini has the wiki as a big repository for capturing, organizing and spreading references and knowledge so that they can find the most recent knowledge *"Wiki is a way where we should go and find the latest "truth" for company"* (Interviewee 2, Capgemini' Consulting, appendix C). The interviewee stressed that it is important to distinguish between the way of using wiki and the way of using blog. Wiki is used for documentation purposes rather than discussion purposes.

> *"...it is important to realize that wikis are for documentation purposes but not for discussion."* (Interviewee 2, Capgemini' Consulting, appendix C).

Capgemini's Consulting Services use a global wiki internally. But externally, they use email for sharing knowledge with their partners. However, interviewee 2 mentioned that there is no reason why they could not share part of their knowledge with their partners using wiki since wiki is more powerful than email for achieving this purpose. He also revealed that the email causes many documents and in different versions to be distributed in many different places or some emails could be lost while wiki lets the knowledge be seen in one place.

When the interviewee mentioned that using wiki externally is better than email for sharing knowledge which has already been shared, I was thinking that they may have concern about the security issue and therefore they do not use wiki. So, I asked interviewee 2 about how they control the accessibility to the knowledge in wiki, he said that they use it internally so no one outside the company can reach it. Then, he added that the security issue is not the reason for why they could not use wiki for sharing knowledge externally but management change culture is other extremely issue:

> *"We can only access wikis internally so you cannot login to knowledge that we do not share. But that is not the reason for why we could not share part of wiki. However, the massive pass that goes into it not from technical perspective because technical perspective is easy but from management change culture is extremely."*
> (Interviewee 2, Capgemini' Consulting, appendix C).

Social Networking Sites (SNS): Capgemini's Technology Services have an internal social network called Yammer. Yammer is a perfect technology for sharing knowledge and communicating internally since it is created for that purpose. It is based on common email root such as ...@Capgemini.com and therefore it allows just the people within the company to use it. Interviewee 1 indicated that Yammer is an internal social network which allows people to participate, share updates and knowledge, link to each other, communicate and discuss. Since Yammer is an internal social network and it cannot be used for increasing Capgemini's contact with weakly tied people, Capgemini has already started an external recruitment's Facebook group and their functionality is on it.

Interviewee 2 indicated that Facebook lets members ask their network about things that they do not have clue about and collects the answers from many people on global sites; otherwise they have to call many people to get the right answer. On the other hand, all the interviewees at Capgemini claimed that Facebook is not the right channel for sharing or storing knowledge and they do not use it for this purpose.

> *"We as a company do not use Facebook for "knowledge sharing"* **with our clients** *today and we think that it may not be the right channel for that purpose. Facebook is an excellent marketing and recruitment channel for Capgemini. Capgemini already have a Facebook group for this purpose. We however, use a somewhat similar tool - Yammer – for internal knowledge sharing."* (Interviewee 1, Company' A Technology, appendix B).

Capgemini's recruitment is a great area for using external social networking and interviewee 2 expected that Capgemini's Consulting will witness progress within its business in the future when its external social networking becomes ready to work. The interviewee also indicated that web 2.0 tools are all together contributing to the progress of business in companies if they are used externally since they allow people to interact,

participate, develop ideas, discuss, create and share knowledge. Connect & Develop innovation model is a great example for the innovation that has been created at the Procter & Gamble Company. The Connect & Develop model is global networks that connect people with each other using social media tools. Scientists post problems on these networks for finding good ideas and bringing these ideas to develop products and enhance the internal capabilities (Interviewee 2; Huston and Sakkab, 2006). Dell idea storm that was mentioned before is another great example of the innovative use of web 2.0 technologies.

Table 4.1 summarizes the use of web 2.0 technologies like blog, wiki and SNS at Capgemini according to interviewee 1 and 2.

Table 4.1: Summary of using web 2.0 technologies at Capgemini

Interviewee (Company)	Web 2.0 tools	Are web 2.0 tools used internally or externally or both?	How businesses are using web 2.0 tools?
1 (Capgemini' Technology)	Blog	Internally	Internally: At Capgemini Technology, all teams share one blog where team leaders post their assignments and team members comment on the same blog. In this way, teams learn about each other, share knowledge and communicate with each other.
	Wiki	Global Wiki: internally Project Wiki: internally & externally	Global wiki: It is an internal wiki that allows employees to contribute and share knowledge. Project wiki: It allows all partners and employees to sharing knowledge projects and notes about a specific project in order to share common understanding between peers.
	SNS	Internally (Yammer)	Capgemini Technology uses Yammer as an internal social network that allows people to follow each other, participate, discuss and share knowledge.
		Web 2.0 contributes in the progress of business	E2.0 technologies are peer to peer. They allow people to participate, contribute, communicate, share knowledge and develop ideas.
2 (Capgemini' Consulting)	Blog	Externally	Blog is used for discussion purposes. Capgemini's Consulting uses an external blog to come into community and discuss. They post blog in hopes of linking smart people and vice versa.
	Wiki	Internally (global wiki)	Wiki is used for documentation purposes. The wiki is a repository where people document the best practices. Anyone can add knowledge and references into the wiki. So, the wiki is a place where you should go and find the latest "truth".
	SNS	Externally (Facebook)	Capgemini's recruitment is a great area for using external SNS like Facebook because Facebook let the company find new stuff and increase the participation in discussion. So, the purpose of using SNS externally is to increase company's contact with weakly tied people.
		Web 2.0 contributes in the progress of business	Web 2.0 technologies are all together contributing to the progress of businesses at companies if the latter allow customers and partners to participate, develop ideas, discuss and share knowledge. Dell idea storm and Connect and Develop Model are great examples of the innovative use of web 2.0 technologies in companies.

4.2.2 Company X

The communication of Company X started moving continuously towards web 2.0 and social media aspects last year. The company is using wikis, blog, social networking and other web 2.0 tools in order to create a more social environment. Today, the company is using these tools internally but they want to turn that around and prepare for using these tools both internally and externally. Interviewee 4 provided me with an understanding about how they use blog, wiki and social networking.

Blog: Company X uses blog in small scale as a pilot. The company has a number of small blogs within teams. These blogs have enabled the employees to link content to each other as well as cross referencing, share knowledge, communicate and discuss about business matters. The blog increases the awareness of each person within the company bout other teams and projects. The blog also limits the number and the time of meetings at the company for making decisions. The employees use blog to initiate a discussion by posting on blogs and linking to each other in order to find experienced people that share the same interests. These people are able to give advices about a specific project or even on how to begin with a specific issue. In this sense, they can ensure that they do things the right way and avoid the mistakes that have been done by other people.

> *"We use blogs (in small scale as a pilot) primarily to discuss business matters within teams. We find that blogs decrease the time of meetings, especially when we try to find time for meetings with many people and simultaneously increase everyone's awareness about other projects and ensure that we do right thing. People discover that other people have experience in similar areas and can get help or feedback before doing the same mistakes as others, therefore we can benefit from trust and better quality"*. (Interviewee 4, Company X, appendix E).

Since blog is an efficient way of sharing knowledge, have discussions and keeping people aware of what is going on in different departments and getting feedbacks from relevant people even without knowing whom to ask, Company X uses it to break the departmental isolation that is so common in global companies.

On the other hand, email is one to one communication and its content is just restricted to its senders and receivers so the wrong content cannot be corrected or reviewed by other experienced people. Furthermore, some emails might be lost or knowledge might leave with the employees. However, email still has its place in keeping the security of private conversation, documents and practical tasks.

> *"There are private conversations and practical tasks that still have a place in one-to-one e-mail conversations, but for collaboration and collective learning and sharing, e-mail is not (and have actually never been) the right tool."* (Interviewee 4, Company X, appendix E).

Although blog is a perfect media for open discussion and sharing knowledge, the company has not used it externally yet. The reason is that people outside the company still consider word "blog" a buzzword and they are not satisfied that blog is beneficial from business perspectives or they think that the blog may come up with negative effects for those who are used to use controlled communications and traditional channels. So, Company X is using a Marketing Web Site and other tools that keep the external interaction non-public externally (i.e. e-mails and direct messages to relevant employees).

> *"For employees who are used to use online channels, blogs are basically web pages with the possibility to get feedback and initiate conversations, to others the word "blog" may be considered a buzzword or even have some negative connotation for those used to use a more controlled way of communicating with external parties."* (Interviewee 4, Company X, appendix E).

Wiki: Company X is using wiki as an internal dictionary but in a more advanced way. First, employees enter a dictionary of abbreviation, expressions and phrases that they have as a "traditionally" managed document into the wiki. Second, they let people that have something to offer contribute to this dictionary through adding more abbreviations and supporting them with detailed knowledge on products, services and procedures so that the wiki gets more complete with relevant knowledge for every addition.

> *"We had about 300 words to start with and with continuing the contribution after only a few months we had over a thousand abbreviations listed"* (Interviewee 4, Company X, appendix E).

Finally, the employees explain these abbreviations, expressions and phrases or give a very generic overview of a specific products, services and procedures by linking them to traditional "official" pages with publishers/ owners of the information on the intranet. The wiki is full of knowledge that people contribute to it and use it more and more because it is more relevant and valid so the wiki is contributing to the progress of business at Company X.

> "*It takes less total work time and the information becomes more valuable for the right people to update it when appropriate than it would take for someone with limited knowledge (and we all have incomplete knowledge when it comes to this range of information) to gather the information by asking around."* (Interviewee 4, Company X, appendix E).

The employees of Company X do not use wiki externally today but they are taking into account the possibility of using it with their key customers so that the latter can participate and contribute with different type of information sources like technical service instructions or similar and add their inputs to improve the quality of documentation as well as give their feedback about products and services that are found in the company.

Social Networking Sites (SNS): Company X does not use SNS like Facebook and LinkedIn to spread their knowledge today but there is still an ongoing discussion about the affect of using these tools on the corporate image of the company. Company X is using Yammer as internal social network. Interviewee 4 defined Yammer as a micro-blogging tool that offers Twitter-style interaction. Yammer keeps the employees interacting with each other and share knowledge. But, they are not satisfied with this kind of network because it does not help them to find new staff and new information.

> *"Yammer is a micro-blogging tool that offers Twitter-style interaction while keeping the information exchange contained within the company's employees, but it's not promoted by us and not widely accepted as a daily source of networking or finding information."* (Interviewee 4, Company X, appendix E).

Interviewee 4 mentioned that some people at the company using Google Wave which is a connection platform that connects the email with social tools like wikis, social networking,

integrated live chatting, collaboration on documents, sharing of images, maps and videos etc. It is interesting and powerful platform, however Google Wave let them find just people that they are already known but they cannot find new people in the second degree and discuss with them. So, Google Wave is not sufficient for enhancing the business of companies.

Today, the company is dividing its communication into internal and external communication and keeping the nature of the information very different. Internally, the company uses web 2.0 tools and other tools for communication but externally they use tools like marketing website, email and other tools. So, the people that communicate internally do not always understand the people that communicate externally.

Interviewee 4 stressed that social media tools are open technologies and part of communication. If the company wants to exploit these technologies successfully, it has to change its behavior and communication towards openness and agility. As a result, the company will share the same knowledge with its external partners and gain a greater understanding as well as enhancing its relation with its outside world.

> *"Social media tools are part of the communications portfolio, and as the community we work in changes towards openness and agility we must change our communication to adapt to this environment. If we do it properly, the gain will be a greater understanding of our customers and partners as well as a more personal and genuine relation to the world around us..."* (Interviewee 4, Company X, appendix E).

Table 4.2 summarizes the use of web 2.0 technologies like blog, wiki and SNS at Company X according to interviewee 4.

Table 4.2: Summary of using web 2.0 technologies at Company X

Interviewee (Company)	Web 2.0 tools	Are web 2.0 tools used internally or externally or both?	How businesses are using web 2.0 tools?
4 (Company X)	Blog	Internally	The company has a no. of small blogs (as a pilot) within teams. Each team has a blog and those blogs are linked with each other to increase the awareness about other projects and teams, share knowledge, initiate conversation about business matters, reduce meetings and develop ideas. It is used also to decrease the isolation between departments in global companies like Company X.
	Wiki	Internally	They use wiki as a small dictionary where they document abbreviation, phrases and expressions. People can contribute through entering more abbreviations and linking them with explanation about specific products, services and procedures.
	SNS	Internally (Yammer)	Yammer is a micro-blogging tool that offers Twitter style interaction for exchanging and sharing knowledge between employees but it is not a powerful tool for finding new people and knowledge.
		Web 2.0 contributes in the progress of business	E2.0 technologies are part of communication, they aim to change the businesses towards more openness and agility. In order to meet the goal of E2.0, companies should share their knowledge externally to gain a greater understanding of their customers and partners and genuine relation with outside world.

4.2.3 Volvo-IT

Volvo-IT is using web 2.0 tools (blog, wiki, social networking etc.) internally for communication and knowledge sharing, supporting dialogue etc. But they do not use them for external communication or sharing. Because the interview with this company was via email, they provided me with short answers to my questions. In spite of that, I added these answers for more reliability and to provide the reader with additional information about the use of web 2.0 tools in companies.

The company is using blogs and wikis in their teams' collaboration solution (based on SharePoint 2007) and social networking is also based on SharePoint capabilities to provide a personal site called MySite.

Blogs: the company is using blog to share knowledge, thoughts and to generate discussion or debate. The blog is used in different levels at the company as a dialogue between management and employees using postings and comments and they use blog also for questions and answers and therefore blog is a very powerful sharing knowledge tool.

Wikis: team members participate to wiki and create knowledge. They share knowledge by linking content to each other using links and pictures.

MySite: each employee in the company has a personal site where he/she manages, stores his/her own information, content, documents, links etc. MySite is used to share employee's information, documents, etc. with other employees in the company. This also can be done in a blog hosted in MySite.

Interviewee 5 mentioned that using web 2.0 technologies externally can come up with effectiveness to the company if it involves the community at a very early stage with a great success even if the external group is very small since these technologies help the company to reach its goal faster and cheaper in case Volvo-IT shares knowledge without any special demands on network, hardware and software as well as security policies. So, Volvo-IT expects a big development if it expands Enterprise 2.0 to its external group.

> *"...any kind of additional collaboration and sharing knowledge even if the target group is extremely small could bring effectiveness. If you can share knowledge without any special demands on network and security policies and hw/sw it is always easier to reach goal faster and cheaper."* (Interviewee 5, Volvo-IT, appendix F).

Interviewee 5 revealed that web 2.0 tools have unlimited opportunities like developing ideas, sharing knowledge and solving problems. These opportunities contribute to the progress of businesses if the companies train their employees on the use of these tools and change their behavior and culture. The most important thing that companies have to think about is how to change their behavior and culture in order to get the great benefits of these technologies.

> *"The key success factor is accepting the fact that this is more than just a new set of tools. To get the most out of it, it's necessary to change behaviors and culture and train people to understand the use of these technologies".* (Interviewee 5, Volvo-IT, appendix F).

Table 4.3 summarizes the use of blog, wiki and SNS at Volvo-IT according to interviewee 5.

Table 4.3: Summary of using web 2.0 technologies at Volvo-IT

Interviewee (Company)	Web 2.0 tools	Are web 2.0 tools used internally or externally or both?	How businesses are using web 2.0 tools?
5 (Volvo-IT)	Blog	Internally	Blog is used (based on SharePoint 2007) to create a discussion or debate that contributes in knowledge sharing and communication. The blog can be used in different levels at the company. It is used both as a dialogue between the management and employees through postings and comments and also for questions and answers. So, blog is an efficient knowledge sharing tool.
	Wiki	Internally	Wiki is used (based on SharePoint 2007) to allow employees participate, add, delete, edit and share knowledge within links and pictures.
	SNS	Internally (MySite)	MySite based on SharePoint 2007 is used at Volvo-IT as a social network that lets each employee add his/her own information and share it with other employees. MySite contributes in linking employees with each other inside the company.
		Web 2.0 contributes in the progress of business	E2.0 offers many opportunities like developing ideas, sharing knowledge and solving problems for companies that can change their behavior and culture when they deploy web 2.0 technologies.

4.3 Enterprise 2.0: Challenges

Table 4.1 showed that Capgemini is using some of web 2.0 technologies both internally and externally. But, Company X and Volvo-IT are using these technologies just internally. The interviewees mentioned some barriers to the further success of their web 2.0.

4.3.1 Capgemini

Interviewee 2 referred to three Enterprise 2.0 challenges which are culture change, security issue and management experiences.

Culture change is a big issue because it is hard to change the behavior of business leaders who are used to use traditional channels where the business leaders do not discuss the business matters with the employees and even other people e.g. marketing people are communicating through shouting and pushing the knowledge. In contrast, social media is a platform that allows more communicating and listening rather than running an application and this is a completely different behavior. So, the companies that integrate web 2.0 technologies into their business have to change their behavior in order to implement and use these technologies successfully.

The second Enterprise 2.0 challenge is the security issue. Many business leaders do not know how to create a balance between accessibility and control when they embrace web 2.0 tools and therefore these companies fail to use these tools successfully. So, interviewee 2 stressed that security is a big management issue which managers have to take it into account and define guidelines for focusing on how to manage knowledge and keep the balance between accessibility and control. These guidelines are different for each

company. Since email is restricted just to its sender and receiver, managers prefer using email under the light of this issue.

The third issue is a management experience. Many companies do not know how to use web 2.0 tools and therefore they cannot see any business value and success generated by it, especially with people who have not used these tools even for personal purposes. Furthermore, business leaders adopt web 2.0 technologies because they think that young people need to use these tools. Interviewee 2 stressed that this view causes wrong use of web 2.0 technologies so business leaders should change their view and embrace web 2.0 tools for gaining business benefits.

> "*One of the concerns is culture change which means how a company changes its behavior to get benefits of web 2.0 internally or externally because some companies put web 2.0 tools in a place and no one uses them. The other issue is security which companies have to take it seriously and know how to make balance between control and accessibility while using web 2.0 tools. The third big concern is a management experience which means many companies do not know how to use web 2.0 tools to derive their business benefits...some companies engage web 2.0 tools because they think that young people need them which is the wrong way of using web 2.0...they think that they have to have but not that they want to have*"
> (Interviewee 2, Capgemini' Consulting, appendix C).

Also, interviewee 1 mentioned that web 2.0 tools are peer to peer and open so anyone is able to access the secret knowledge of the company if it is shared externally and this is the biggest Enterprise 2.0 challenges. However, the interviewee said that web 2.0 tools lose their functionality if the company limits the accessibility of these tools to the employees. In this sense, interviewee 3 indicated that the security issue is a big management issue when managers do not know how to keep the balance between accessibility and control.

However, Capgemini addressed this issue through classification of its knowledge into knowledge that is allowed to be shared and knowledge that is not allowed to be shared based on an Information Classification Model. The company has to have a policy which is able to classify its knowledge. The company should also use ERM (Enterprise Right Management-tool) to encrypt the internal knowledge so that even if the knowledge is leaked, it is secured from viewing. Moreover, tools like Proxy should be used in order to block some content or words. Thus, interviewee 3 mentioned that he will consider the user friendly and follows the following rules:

1. *"Definition of security. Security has to be viewed upon as an enabler of services. The mission for security is to enable services in a safe way.*
2. *Risk analysis. A RA has to be done to determine the possibility of a threat for the company when using social media.*
3. *Information classification Model. Certain types of information should be labeled as classified, i.e. not be allowed to share externally.*
4. *We have to have policy which could determine which knowledge is allowed to be shared and which knowledge is not allowed to be shared.*
5. *Security awareness. Personnel should undergo training to understand and learn about consequences of sharing information in web 2.0.*
6. *IAM – Identity And Access Management. Every user should have a unique and traceable username.*
7. *ERM - Enterprise Rights Management-tool. This should be used to encrypt information so that even if it is spread it is secured from viewing.*
8. *Logging. All user actions have to be logged and information that logs will be used for prosecution in case of a breach.*
9. *Monitoring of web 2.0. Users should allow monitoring of their usage.*
10. *Proxy. To be able to block some content or words a proxy should be used."*
(Interviewee 3, Capgemini' Technology, appendix D).

Concerning risks like inappropriate behavior and irrelative content, inaccurate information and embarrassing information it has previously been mentioned in section 2.8, interviewee 3 said that it is important to have a ***policy*** that decides which knowledge is allowed to be shared and which knowledge is not allowed to be shared. If policies are broken, logging to internal knowledge investigates incidents and retribution.

Capgemini uses ***CIA*** described in ISO 27001. CIA refers to Confidentiality, Integrity and Availability. Data Confidentiality allows just authorized people (right people) to access information resources. Data integrity refers to trustworthiness of information resources that cannot be changed improperly. It also includes origin or source integrity so that you can trust this information because it comes from an authorized person rather than imposter. Data availability ensures that system stores information, works promptly and service is available and not denied for those who need it. The Company also uses ***BIBA*** (security architecture model) in order to make sure that the information is correct while ***Bell-La Padula*** is used for confidentiality. Capgemini has realized that theft is a danger if the important information is leaving, and moved around, outside the company or stolen using social media tools so security measures have to be implemented to avoid theft. The security measures could be block access to the important sites, pre approval of information and so on and so forth. Regarding embarrassing information, the interviewee said that they cannot delete what others write about them online but instead they can benefit from that and develop their business.

> *"The most important is policies for stating what is allowed, logging to investigate incidents and retribution if policies are broken. We can also use CIA which refers to Confidentiality, integrity and availability. The three cornerstones of security as described in ISO 27001. We use also BIBA as a security architecture model for integrity and an access control system for making sure that information is correct. Bell-LaPadula is used for confidentiality. Regarding embarrassing information, we cannot change or delete what others write about us but instead we can develop out business and write about our progress."* (Interviewee 3, Capgemini' Technology, appendix D).

The other issue that the interviewee mentioned is that some companies do not know how to use web 2.0 tools in the light of success because there is a lack of familiarity and experiences of implementing these tools.

Table 4.4 summarizes Enterprise 2.0 challenges that are mentioned by interviewee 1, 2 and 3 at Capgemini as well as red herring challenges that are stated in section 2.8. Then the table provides an overview as well as responses to these challenges based on the interviewees.

Table 4.4: Summary of E2.0 Challenges at Capgemini.

Interviewee (Company)	Risk/Concern	Overview	Responses
Interviewee 1, interviewee 2 and interviewee 3 **(Capgemini)**	Culture Change	How hard to persuade the business leaders to change their behaviors.	Business leaders must decide to change their behavior if they want to access the opportunities of E2.0.
	Management Experiences	Many companies do not know how to use web 2.0 tools and they deploy these tools because they believe that young people need them.	The companies should change its perspective and deploy web 2.0 tools in order to access the opportunities of E2.0.
	Security issue	It is hard to make a balance between accessibility & control.	Managers should define guidelines & rules such as policy, Inf. Classification Model, IAM, ERM, logging, monitoring and proxy.
	Inappropriate behavior and content	Some people disturb the company by writing irrelevant or offensive online inf.	Policy should monitor the behavior of people inside the company. Also, the company uses models like BIBA, Bell lapadula and CIA.
	Inaccurate inf.	The employees may post incorrect inf. that damages the reputation of the company.	The company follows CIA, policy, BIBA and Bell lapadula to avoid posting inaccurate inf.
	Embarrassing inf.	People might post negative online comments company's products and services.	The company cannot delete or change what others write but instead the employees can develop out their business and write about their progress.
	Stealing inf.	It is a danger if the inf. leaves the company or be stolen.	The employees have to implement security rules that are listed in section 4.3.1.

4.3.2 Company X

Interviewee 4 mentioned three challenges. The first challenge is management's concerns of losing control over its communication and information flow in case of using web 2.0 tools externally. The reason is that these technologies have free access and allow many people at different levels (from farmers to analysts and CEOs of suppliers, customers and marketing people) to participate and provide a confusing and even contradicting message. In other words, the facts that the employees provide about the company's products will be mixed with guesses, estimates, rumors and even errors. In this sense, the employees will lose the trust of their partners.

The interviewee indicated also that a lot of information is a good thing, but can blur the facts. However, if employees get the communication culture right, people will know how to express opinion and separate that from official product specifications. But from the managers' perspective, there is of course a fear that they will go from clear communication to unclear communication. They fear the loss of control over the communication scenarios. However, interviewee 4 mentioned that they know the change is happening anyway, and it's more a matter of adopting web 2.0 technologies in the right way than refusing or resisting the change altogether.

The second challenge is that the company sometimes does not want to share their knowledge with their customers or even think that the latter need them. People at the company do not like such behavior so they want to change this behavior and share the knowledge in more open and flexible way.

The third challenge is that Enterprise 2.0 is still new and many people outside the company have not used these tools even for personal purposes because they think that these tools are just buzzwords. This generates a gap between people and technologies. However, the interviewee indicated that people and tools are getting more and more compatible.

> *"first, the management does have a fear of losing control over our communication, our brand ...second, we sometimes treat information as something we must keep locked in so that our customers need us, and we don't really want to have that kind relation with our customers...Third, there is a challenge in offering technical solutions that are intuitive to all users...many don't even have experience in working with social media tools for personal purposes..."* (Interviewee 4, Company X, appendix E)

Interviewee 4 said that Company X takes the security issue into account and relies on three factors in order to keep the balance between accessibility and control and avoid risks like inappropriate behavior and content, inaccurate information, embarrassing information and theft. The first factor is that Enterprise 2.0 tools on intranet should tell who made each contribution. So, if there is any misbehavior, the person could be identified, educated to keep his/her behavior as normal.

The other factor is that the employees are guided by core values instead of instructions. The company lets employees interpret core values with legal obligation that are defined within their employment contract and based on local jurisdictions. The company also creates social media guidelines that let people choose whether they want to be a communicator on behalf of the company or just be employees with no such official role. These guidelines help people to understand the risks in this area and how to avoid them.

Thus, Company X follows core values, guidelines and policies in order to keep the balance between individual freedoms and individual accountability.

The third factor is that the secured documents are not shared, communicated and stored on Enterprise 2.0 tools so that no one can disclose these documents. If any of these documents disclosed by chance, it will damage the company. However, the employees are trained on information security and how to keep the knowledge more secured.

Furthermore, interviewee 4 indicated that confidential material leaking is always risk and can occur with or without Enterprise 2.0 tools e.g. anyone can save the knowledge of the company on USB stick memory and publish it outside the company. Thus, there is no reason to avoid Enterprise 2.0 tools or to argue that the risks are more than benefits.

> *"First, the social media tools we select should maintain an atmosphere of transparency and openness regarding who posted what...second, we have a corporate culture driven and guided by our core values, which are continuously communicated and re-enforced... finally, when talking about confidential material leaking, this is always a risk and at any given point, an employee with sufficient access could potentially copy material onto a USB memory stick and transport this information outside the building... but it's not a reason to avoid social media or to argue that the potential risk is greater than the benefits."* (Interviewee 4, Company X, appendix E)

Table 4.5 summarizes Enterprise 2.0 challenges which are listed by interviewee 4. The table also provides the reaction of Company X to both challenges that are mentioned by interviewee 4 and red herring challenges in section 2.8.

Table 4.5: Summary of E2.0 Challenges at Company X.

Interviewee (Company)	Risk/Concern	Overview	Responses
Interviewee 4 (Company X)	Loss of the control over the information flow	The company has a fear of losing the control over its communication if it uses web 2.0 tools externally because the managers want our customers to trust what we communicate instead of being confused with mixed messages.	It is better to get a communication culture right rather than refusing the use of web 2.0 technologies completely.
	Selfish behavior	The company may not want to share its knowledge with their customers so that the latter need them.	The employees do not like this behavior with their customers so they try to share their knowledge with the customers on web 2.0 technologies.
	Management experiences	Many companies think that web 2.0 technologies are just buzzwords. This creates a gap between tools and people.	People and tools are getting compatible gradually. Moreover, people need to train and learn about these tools.
	Stealing information	Steal company's knowledge.	Theft could happen with or without E2.0 tools.
	Inaccurate inf., inappropriate behavior and content and embarrassing inf.	They are explained in section 2.8	First, identities of E2.0 participants have to be declared on intranet. Second, employees are guided by core value instead of instructions. Third, secured documents are not shared. Now, the company puts guidelines in order to determine the pitfalls and how to avoid them.

4.3.3 Volvo-IT

Interviewee 5 mentioned that the generation gap, training & learning and policy are three barriers for further success of Enterprise 2.0. People at the company think that Enterprise 2.0 tools are available for young people since they are more familiar with using these tools. Of course, this generates a gap between people since some of them are using the new technologies and others are using traditional technologies.

People have to get the opportunities of Enterprise 2.0 through ending their jobs due to age and educating people about the goals of Enterprise 2.0 technologies and how to select the right tool and use it properly as well as how to change their behavior to use these technologies successfully. In order to communicate and share knowledge safely outside the company, security policies are important for such communication.

> *"The key success factor is accepting the fact that this is more than just a new set of tools. To get the most out of it, it's necessary to change behaviors and culture and train people to understand. Security policies are important when working with people outside company"* (interviewee 5, Volvo-IT, appendix F).

Concerning risks like inaccurate information, inappropriate behavior and content, theft and embarrassing information, interviewee 5 said that it is necessary to have some basic information and education in order to guide users (old generation people) to create a right culture in the use of web 2.0 technologies. He also mentioned that these risks have a minor important in comparison to the opportunities of Enterprise 2.0 technologies if these technologies are used properly and the company improves its experiences at every level.

Table 4.6 summarizes the barriers for the further success of Enterprise 2.0 and provides an overview as well as responses for these challenges based on interviewee 5 at Volvo-IT

Table 4.6: Summary of E2.0 challenges at Volvo-IT.

Interviewee (Company)	Risk/Concern	Overview	Responses
Interviewee 5 (Volvo-IT)	Generation gap	People think that E2.0 tools are available for young people.	The company should end job due to age through educating the employees about using web 2.0.
	Training & learning	People at company do not know how to use social media tools.	It is necessary to change behavior and culture by educating and training people to understand the new technologies and change their behavior.
	Security issue	Concerns about sharing knowledge externally.	Security policy is important for doing a right communicating externally.
	Inaccurate inf., inappropriate behavior and content , theft and embarrassing inf.	They are explained in section 2.8	It could be necessary to have some basic education and various information initiatives to guide users (the old generation) to create a new and professional culture in the use of web 2.0 technologies. These risks have a minor importance since the gains of E 2.0 technologies are great and the company enriches its experiences at every level.

5 Analyses and Discussion

After having presented the literature and empirical findings throughout this thesis, this chapter will present both a discussion and an analysis of these findings linked with the main themes that are used in the empirical findings. A comparison between literature (chapter 2) and the empirical findings (chapter 4) will be provided in order to get a picture of the usage of web 2.0 technologies such as blog, wiki and SNS as well as Enterprise 2.0 challenges.

5.1 Using Web 2.0 Technologies in the Global Companies

Blog: the literature has indicated that blog is an automated website for publishing so it lets people type in their observations and links them to other interesting and useful websites or a particular post (Lears, 2003). In this sense, a blog contributes to the development of ideas, communication, and an initiation of conversation and knowledge sharing (Efimova, 2004).

The empirical findings supported what the literature indicated, and the interviewees explained how they are using blog to achieve these purposes and added some interesting contributions regarding the blog (see section 4.2 as well as table 4.1, 4.2 and 4.3). The empirical findings indicated that blog is used to create a discussion or dialogue about business matters. The discussion contributes to the sharing of knowledge. It adds an awareness of other projects and teams, leads to the development of ideas, the finding of experienced people with similar interests. It also breaks down departmental isolation, especially within global companies. The blog is an easy way to promote a strong relationship among people within and between companies as well as individuals, promote ideas and get help in a specific area.

Interviewees 1, 2, 4 and 5 all affirmed the literature when they said that the way of using blog is to post in the blog so that people who have something to say can participate, trigger the content of the blog. Thus, the blog creates a discussion or dialogue that people can contribute to it and promote their ideas.

Capgemini's Technology department, B and C are using blog internally on their intranet. However, these companies are using internal blog in different ways. Capgemini's Technology department has one blog in whole department and this blog is full of information. All team leaders write in one blog and post it to their team members so that the latter can read the blog and then comment on it. Since the team leaders post and receive comments from different teams, blog allows teams to learn about each other.

Company X on the other hand has a number of small blogs within each team. In other words, each team has a blog and these blogs allow teams to link each other and initiate discussion about different issues. This discussion contributes to an increase in everyone's awareness of different projects, business issues and what the other teams are doing. Since Company X has a number of blogs and these blogs are linked to each other, this means that the company has an internal blogosphere (Jenkins, 2003 cited in Moor and Efimova, 2004; Efimova 2004; Klamma, 2007). However, interviewee 4 mentioned that they have a number of small blogs as a pilot which means that they have not yet rolled out a platform

that anyone can start for their team(s). Instead they have selected some technologically mature areas where the users are aware of the fact that the blogging process and technologies are still being tested and improved.

Interviewee 4 indicated that the blog enables employees to discover experienced people who have the same interest so that these people can guide them to do the right thing and avoid doing the same mistake that have been made by others. The employees can benefit from trust and better quality of project. Learning from other's experiences or tapping into other's knowledge is a prerequisite for effective knowledge sharing and has a great impact on the success of a project (Cross et al., 2001).

Interviewee 5 mentioned that Volvo-IT uses blog in their team collaboration solutions (based on SharePoint 2007) in two levels: as a dialogue between the management and employees and also for question and answers. Thus, interviewee 5 affirmed interviewee 4 when he said that the blog is a very strong knowledge sharing tool.

The literature has indicated that there is a larger group to whom the knowledge worker does not know of. There is a gap between the focal knowledge worker and new people that should be reached in order to convert the potential ties into actual ones and bring people closer. A blogosphere is a powerful technology for converting the potential ties into actual ones (McAfee, 2009) because the blogosphere shares knowledge by linking its content to each other and also by linking people to other content (McAfee, 2009; Lears, 2003; Moor & Efimova, 2004; Efimova 2004; Klamma, 2007). The content of a blog is organized into posts, links and articles which are easy to reach. The companies can use the blog to build a good relationship with their customers by displaying their products and providing information about them (McAfee, 2009; Lears, 2003; Moor & Efimova, 2004; Klamma, 2007)

Interviewee 2 (see section 4.2.1 and table 4.1) confirmed what the literature mentioned when he indicated that the main purpose of using a blog is to become a part of a community and discuss with strong voice. This does so that many people can comment and link to the employees and vice versa. Using a blogosphere externally, allows employees to find new people with knowledge and discuss different business subjects with them.

Thus, interviewee 4 and 2 agreed that the blogosphere is a way to convert the potential ties into actual ones and build relationship with other people through discussion which here means commentary, link people to each other and content as well as making cross referencing possible. A blogosphere is not only contributing towards the building of relationships between people but also a sharing of knowledge. The value of knowledge sharing grows as newly created links increase in numbers inside the blog. This means that blogosphere shares knowledge through links since knowledge is not just found in the content of blog but also in the links (McAfee, 2009).

Interviewee 4 added that the blog chips in into other departments, projects and so on by breaking up departmental isolation within a large company, especially when the company is a global company. This is because the blog increases the awareness of what is going on in different areas of the company and lets people find each other and build strong relationship (see section 4.2.2).

The interviewee also added other new contributions by the blog when he mentioned that the employees are using the blog to discuss business matters with each other and therefore their meetings have been reduced and limited to just decision-making. Also, the blog lets people have better background information about the subject of the meeting, that way they do not get surprised in the meetings.

Interviewee 1 and interviewee 2 indicated however that the blog is more for discussion and communication and it is not the best technology for extracting knowledge or gathering feedbacks from customers. Instead, they think that Dell idea storm is a better way than blog for achieving this purpose. Dell ideas storm is a website that provides a storm session which is supported by multiple web 2.0 technologies where Dell Company posts topics related to business needs and the customers suggest and submit new business ideas for improving business, products and services. The company then votes and takes the best ideas into action. Thus, web 2.0 technologies contribute in deriving business innovation (Interviewee 2, http://www.ideastorm.com/ideaAbout?pt=About+IdeaStorm)

Interviewee 1 and interviewee 2 also mentioned that the blog is not used for solving problems. Alternatively, the Connect & Develop model is an innovation model and it has been built at the Procter & Gamble Company to solve problems, leverage innovation, ideas and talents. These innovations are provided by individuals and companies around the world using web 2.0 technologies. The Connect and Develop model builds a global network where many talented people from different departments and companies are connected using social media tools. Scientists from different departments within the Company are able to identify scientific problems and post them to the global networks where many people whose talent is to solve problems work and post solutions to the networks. As a result, the innovations come back to the company improved, making the creation of better and cheaper products faster.

The blog is used in different ways, from internal use to external use and from one company to the other, and even from one department to another inside a company. The blog is also used at different levels of the Enterprise 2.0 Bull's-Eyes. It is a powerful technology for sharing knowledge through discussion, but it is not the best technology for gathering partner's feedbacks and solving problems. The use of web 2.0 technologies altogether externally is contributing towards the building of relationships and sharing of knowledge with outsiders as well as introducing innovations and developing products and ideas through engaging capabilities from external resources with the business of companies. Dell idea storm and the Connect and Develop Model are great examples of that kind of progress.

Wiki: the literature indicated that a wiki is a website where people create, add, and remove bits of content. It is an efficient technology for sharing and communicating knowledge at any time and any place (Reinhart, 2005; McAfee, 2009).

Although the empirical findings affirmed the literature, the interviewees mentioned that wiki does not only involve knowledge, but it also involves links for linking the knowledge to its references and also to other content. In this way the colleagues can add knowledge into the wiki and extend the initial structure. Linking and tagging expand the structure of a wiki and reflect peoples understanding of how different pieces of knowledge are related to

one another. Traditional KM technologies and channels imposed a hierarchal structure on all the content that was not suitable for sharing an organization's knowledge.

Furthermore, channels such as email face two challenges: version control and simultaneous editing. Version control can be avoided by using a wiki since it is one central repository that keeps all versions of one document while simultaneous editing can be solved using MediaWiki. The MediaWiki alerts users before saving their documents about other similar documents and show the edits that have done by others (McAfee, 2009). The empirical finding agreed with the literature when the interviewees mentioned that companies prefer using a wiki rather than channels like email, because people can see the facts and knowledge in one place using the wiki. While knowledge is distributed in different places or could be lost using email.

The empirical findings confirmed the literature when the interviewees said that the wiki is a repository of knowledge and its quality comes through allowing all employees to add, remove and edit the knowledge. But, the empirical findings showed that the wiki has different types like global wiki and project wiki as well as the uses of wiki differ from internal uses into external uses, from one company to the other and even from one department to the other.

Interviewee 2 mentioned that Capgemini's Consulting uses a global wiki internally as a big repository where the employees document the best practices and findings like articles, models and projects etc. These practices and findings are linked to their references. Also, wiki facilitates updating knowledge so it enables the employees to quickly incorporate the latest truth for the company. Thus, the wiki is a big repository for capturing and spreading knowledge and references. Interviewee 2 stressed that the wiki is used for documentation purposes rather than discussion purposes and therefore the wiki is an efficient technology for strongly tied colleagues (McAfee, 2009).

Interviewee 1 mentioned that Capgemini' Technology uses two types of wiki: project wiki and global wiki. Project wiki is used both internally and externally. In other words, a project wiki is open for both partners and employees to share knowledge and notes about a specific project. The project wiki is a way to build a common understanding between peers. The Global wiki is an internal wiki; it is only available for employees, to share Company's secure knowledge. Thus, the wiki is not only used for the strongly tied level of Enterprise 2.0 Bull's-Eye but it is also used at other levels of this model.

Company X is using a wiki as an internal dictionary but in a more professional way. The knowledge workers enter a dictionary of abbreviations, expressions and phrases into a wiki and link them to knowledge about services, products and procedures. Then, strongly tied colleagues can edit and add more abbreviations and therefore the abbreviations within the wiki have been extended from 300 hundred abbreviations to one thousand words over a time period of a few months. Volvo-IT is using wiki based on SharePoint 2007 for knowledge sharing and linking different knowledge to each other using pictures and links.

The empirical findings showed that the wikis are growing very quickly since anyone can directly add, edit and link its contents to each other. The wiki is a repository of knowledge that people use more and more because it is more relevant and valid than the classic tools. Whereas, wiki facilitates publishing and editing knowledge, the features of wiki support the communication and knowledge sharing in the companies. Furthermore, the empirical

findings showed that the wiki can be used in different levels of Enterprise 2.0 bull's eye; a global wiki is used for strongly tied colleagues while a project wiki is used for potentially tied colleagues. Also, the uses of wiki are different from one company to another and from one department to another since companies and even departments have different purposes.

Social Networking Sites (SNS): the literature showed that people are using SNS to build relationships with other people who have the same interests. A SNS like Facebook allows users to accumulate people and share their profiles with each other. Facebook serves as an address book where users can go and find contact data of their friends and friends of friends that the users can add to their own friend list and therefore the friend list of users are growing over time. Thus, users extend their relationship with other people. (McAfee, 2009; Boyd and Ellison, 2007)

However, the users of SNS are communicating with people who have already participated as a part of community on the social networking site but not with new people who are not members of the network site (Boyd and Ellison, 2007) and therefore McAfee (2009) put them in the second ring of bull eye's diagram as weakly tied people. Since Facebook has flexible features that allow its users to extend their relationship, companies are using Facebook externally to strengthen their contact with weakly tied people.

The empirical findings confirmed that the SNS is used to get into contact with people and showed that companies such as Capgemini's Technology department and Company X are using internal social networking (Yammer) for communicating and sharing knowledge inside the company. This means that only people who have the same email domain can join a given network (see section 4.2 as well as table 4.1 and table 4.2). Interviewee 1 indicated that Yammer is a perfect technology for sharing knowledge and updates among employees, discussing with them and linking employees with each other by creating a network. Thus, Capgemini's Technology department seems satisfied with using Yammer internally for knowledge sharing and communication. Interviewee 4 identified Yammer as a micro-blogging tool that offers Twitter-style interaction and they use it for sharing knowledge among employees. However, the employees of Company X are not satisfied with using Yammer as a daily source of networking since it cannot be used externally to increase the contacts with weakly tied people.

In contrast, Volvo-IT uses MySite with the personal blog as an internal SNS where the employee adds his own information and shares it with his colleagues. The SNS of Volvo-IT is based on SharePoint.

I also asked interviewee 4 whether they use Google Wave. The interviewee answered that Google Wave is a powerful platform which connects email with social media tools like wikis, maps, video etc so some of the employees at the company use it. However, Google Wave is not a tool for finding new people.

The internal communication of Company X is separated from the external communication because the clients of Company X still think that web 2.0 technologies are buzzwords. For that reason, the people that communicate internally do not understand the people that communicate externally. However, Company X is planning to use web 2.0 technologies externally in order to unify their communication and share the knowledge with their partners. Thus, web 2.0 is seen as a way to make people understand each other and enhance the business of the company.

Capgemini has already started an external recruitment Facebook group but the functionality is still on Facebook. Since Facebook is used to enhance the contacts with weakly tied people and asking them for help in specific areas, the employees of Capgemini consulting will use Facebook externally in order to find experienced people who can help them to discover thing that they do not have clue about otherwise. Today, they use phone or email and contact person after person in order to reach the right person who can answer their questions. Using traditional channels to find new people is boring and expensive especially with the phone.

Interviewee 1 and interviewee 2 indicated that recruitment is a great area to use Facebook for since Facebook is used as external network to create participation in discussion and finding stuff. Furthermore, interviewee 2 expected that Capgemini will witness a great progress within its business in the future when Facebook becomes ready to use.

However, all the interviewees of Capgemini stressed that Facebook is not used to share knowledge since it cannot store knowledge but Facebook is used as an address book to strengthen the relationship with weakly tied people and find the expertise that is missed in specific fields.

As a result, SNS has different types like Facebook, Yammer and MySite. These types are used differently and for different purposes. For that reason, SNS can be used in different levels of strength ties.

Table 5.1 summarizes the use of web 2.0 technologies in both literature and empirical findings.

Table 5.1: Comparison between literature and empirical findings about using web 2.0 technologies in business

Research Question	Comparison	Blog	Wiki	SNS
How are global companies using web 2.0 technologies?	**Literature**	• It is an automated website publishing that let people type their observations and link them to other interesting website (Lears, 2003). • It is contributing in developing ideas, communicating, initiating conversation and sharing knowledge (Efimova, 2004). • It converts the potential ties into actual ones through linking people to each other (McAfee, 2009).	• It is a website where people create, add, remove and edit the knowledge within it. It is a powerful tool for sharing knowledge at any time (Reinhart, 2005; McAfee, 2009). • Wiki has features that enable it to be used for strongly tied colleagues. Wiki is a central repository and therefore it solves problems like version control problem and simultaneous editing problem. These problems are caused by email (McAfee, 2009).	• SNS is a website like Facebook where users add new people who are already member within SNS but the employees do not know. So, SNS strengthen the relationship with weakly tied people (McAfee, 2009). • Facebook serves as address book where users can go and find contact data of their friends and they can also link friends of their friends. So the friend list grows with every addition (McAfee, 2009; Boyd and Ellison, 2007).
	Empirical findings	• Technology department of Capgemini has one internal blog where team leaders post their assignments and team members comment on the same blog. In this way, teams can learn about each other, share knowledge and communicate with each other. • Other department of the same company as consulting department of Capgemini uses an external blogosphere where the company comes as a part of community and links new experienced and smart people and the latter link the company. So, blog is a place where people discuss and build relationship with each other. Thus, Capgemini uses blogosphere to convert the potential ties into actual ones. • Other company like Company X has an internal blogosphere. This means that the company has a no. of small blogs (as a pilot) within teams. These blogs are linked with each other so that teams discuss about business matters, learn from others' experiences, share knowledge, communicate with each other, develop ideas, reduce meetings and restrict them just for making decisions. • Volvo-IT uses blog (based on SharePoint 2007) at two levels: for dialogue between the management and employees and for questions and answers. • Blog is not the best tool for extracting knowledge or gathering partners' feedbacks.	• One department of a company as technology department of Capgemini uses two types of wiki: project wiki is used internally and externally for sharing knowledge and notes about a specific project with the partners of the company. Global wiki is used just internally for sharing the internal knowledge. • Other department of the same company as consulting department of Capgemini uses global wiki as a repository where people contribute and document the best practices. So, wiki is used for documentation purposes. It is a repository for capturing and spreading knowledge and references. So it is a place where people go and find the latest truth. • Other company like Company X is using wiki as an internal dictionary for storing abbreviations, expressions and phrases and linking these abbreviations with knowledge and explanations about services and products. • Other company like Volvo-IT is using wiki for sharing knowledge through links and pictures. • Volvo-IT uses wiki (based on SharePoint 2007) to share knowledge through links and pictures.	• The technology department of Capgemini and Company X are using internal SNS like Yammer to communicate and share knowledge but these companies cannot use Yammer to contact with weakly tied people. • The consulting department of Capgemini uses external SNS as Facebook in recruitment area for finding new staff and increasing the contact with weakly tied people. • Other company like Volvo- IT is using MySite as an internal social networking site where people see profiles of each other. • SNS is a website where employees ask questions and weakly tied people answer them. • Facebook is not used for knowledge sharing because it does not store knowledge.

5.2 Enterprise 2.0: Challenges

The literature mentioned that the managers have two categories of concerns around Enterprise 2.0: red herring concerns and long haul concerns (see section 2.8).

The empirical findings showed that Capgemini is using web 2.0 tools internally and externally while Company X and Volvo-IT are just using web 2.0 tools internally (see table 4.1, 4.2, 4.3). Each interviewee pointed to the main Enterprise 2.0 challenges that many companies are concerned about (see table 4.4, 4.5, 4.6). In order to understand these challenges, let's first place them into three common categories which are the security issue, culture change and management experiences based on the interviewees and then explore how the companies have addressed these challenges. This section will cover a discussion about these categories.

Security issue: interviewee 1, interviewee 2, interviewee 3, interviewee 4 and interviewee 5 all agreed that the issue concerning security and how to create a balance between accessibility and control is a big management issue. Interviewee 1 mentioned that many companies do not want to share their secrets with other companies using web 2.0 tools because these tools are free to access by anyone. The interviewee also indicated that web 2.0 tools lose their functionality if management controls the accessibility of people.

Interviewee 4 mentioned that the managers are afraid of losing their control over the information flow if they move from clear communication to unclear communication using web 2.0 technologies. In other words, the facts that the employees provide about the company's products, and upon which the customers base their decision, will be a mix of rumors, estimates, error, etc of individuals who participate within these technologies and are from different levels (from farmers to analysts and CEOs of suppliers, customers and marketing people). A lot of information is good but it can blur the fact that must be delivered to customers and other partners since we are all human and make errors in conversations. When these conversations are public or semi-public, it's potentially damaging the business of the company. This is really a challenge.

However, Capgemini, Company X and Volvo-IT have addressed this issue effectively. Interviewee 2 stressed that the managers have to define and develop guidelines in order to create a balance between accessibility and control. These guidelines are not same in all companies. Since interviewee 3 is an experienced security architect, he explained how they avoid or reduce the security issue. The interviewee considered that the people of Capgemini are friendly and follow the security rules like the Information Classification Model, policy, RA, ERM, IAM, Proxy, training about keeping the security of the information on the social technologies, etc (see the security rules in section 4.3.1).

Volvo-IT uses a security policy for protecting the knowledge that is shared externally. Company X also takes the security issues into account and relies on three factors in order to create a balance between accessibility and control and, to reduce risks like misbehavior, inaccurate information, and embarrassing information. The first factor is that all users' identities have to be revealed in the intranet in order to identify the people who do misbehavior and educate them to work in a normal way. In this sense, interviewee 4 agreed with interviewee 3 and McAfee (2009) (see inappropriate behavior and content in section 2.8)

The second factor is that the secured documents are separated from other information and not produced or stored in the open web 2.0 tools. In the case of anyone revealing the information by accident, this will damage the business of the company through the greater impact of web 2.0 tools. So, employees should get special training that covers the online communication. There, interviewee 4 agreed with interviewee 3.

The third factor is that Company X lets its employees interpret core values in combination with legal obligations that are defined within their employment contract and local jurisdictions. The other social media guidelines which the company gives the employees are that they have the freedom to choose whether they want to be a communicator or not. These guidelines help the employees to understand possible pitfalls and how to avoid them. Thus, core value and other relevant guidelines and policies keep the balance between individual freedom and accountability.

Regarding theft, McAfee (2009) mentioned that some companies do not want to share their knowledge using web 2.0 tools because they are afraid of other people who may steal their knowledge. However, the benefits of Enterprise 2.0 tools outweigh the risks (McAfee, 2009) so people should not only see Enterprise 2.0 tools from the risk side but also see the advantages and benefits that may outweigh the risks.

Interviewee 4 affirmed McAfee (2009) when the interviewee said that the theft is not a reason to avoid using social media tools or argue that potential risks are greater than the benefits. The interviewee also mentioned that the theft could happen with or without using social media tools. This means, anyone could use a USB-connection and take a copy of the internal knowledge and then publish this knowledge outside the company. However, interviewee 3 stressed that the theft is a big danger with knowledge being stolen. Therefore the company has to implement the security rules to avoid such risks. Interviewee 5 at Volvo-IT affirmed interviewee 4 when he said that it could be necessary to have some basic education and various information initiatives to guide users (the old generation) to create a new and professional culture in the use of web 2.0 technologies. These risks have a minor importance since the gains of Enterprise 2.0 technologies are great and the company enriches its experiences at every level.

The literature mentioned that posting inaccurate information or answers to other's questions could damage the reputation of the company. However, the self-policing can determine and correct the wrong information (McAfee, 2009). Interviewee 3 indicated that they are using policy; CIA, BIBA and Bell La Padula model to keep the confidentiality and ensure that the information is correct (see section 4.3.1).

Although security is a big management issue, the empirical findings and literature shows that the company can avoid or reduce this issue. As a result, the security issue is a red herring (McAfee, 2009).

Culture change: interviewee 2 mentioned that the culture change is a big issue, since it is difficult to change the classical behavior of business leaders into more social behavior. This means that people like marketing people are used to use the traditional channels and communicate in a one way direction through shouting and pushing knowledge, making it is hard for them to change their current behavior into many to many or social communication using web 2.0 technologies.

Interviewee 4 said that some companies do not want to use social media tools to share knowledge with their customers, so that the customers need them. In other words, they do not discuss their ideas and business matters with external people but instead they behave selfishly towards other and protectively towards oneself. This leads them to work and remain in one direction mode (unilateral control) based on theory-in-use which explains why many companies fail to use social media tools (Kofman, 2003; McAfee, 2006; Newman and Thomas, 2009). Web 2.0 tools are social and many people can contribute through them. Interviewee 2 and McAfee (2009) mentioned that web 2.0 is a platform that allows more communication and listening rather than running an application and this is completely a different behavior that before.

This affirms what the literature states i.e. that the challenge is how hard it will be to get people to change their way of interaction and communication into a more social communication. The reason being that Enterprise 2.0 still is a puzzle word for many people. Consequently, companies deploy web 2.0 technologies but there is no one who uses them. The global survey that is conducted by McKinsey (2008) showed that only 21 percent of respondents were completely satisfied, 22 percent were clearly dissatisfied and 7 percent had tried at least one technology but stopped using it. Thus, the success of the new technologies comes slowly to companies and therefore the implementation of Enterprise 2.0 is a long haul (McAfee, 2009).

To solve this problem, the business leaders and managers have to follow espoused theory that encourage and stimulate the use of the new technologies in order to create platforms, improvement and development. They require managers to reject the unilateral control, be social and open minded managers instead of selfish (work bottom up instead of top down) and allow others to participate in discussions and exchange views on business matters in order to base them on most valid knowledge (Kofman, 2003; McAfee, 2006).

Interviewee 2, interviewee 3, interviewee 4 and interviewee 5 affirmed that social media tools are open technologies and part of communication. If the company wants to exploit these technologies successfully, it has to change its behavior towards more social and open communication.

Management experiences: interviewee 2, interviewee 3, interviewee 4 and interviewee 5 mentioned that the third challenge is that many managers do not know how to use web 2.0 technologies and they think that these technologies are just buzzwords. Some companies deploy web 2.0 technologies because they think that the young people are more familiar with using these technologies. In other words, managers believe that they have to have web 2.0 instead of understanding why they should have it. As a result, a gap is generated between the older and young employees (See section 4.3).

However, McAfee (2009) mentioned that the younger people who are more familiar with web 2.0 technologies and eager to demonstrate the new social tools can communicate with the older people and educate them about the goals of Enterprise 2.0 technologies. They can also help them to select the appropriate technology in order to achieve these goals and develop the business. Interviewee 2 and interviewee 5 affirmed the literature when they said that people have to get the opportunities of Enterprise 2.0 through ending jobs due to age. Interviewee 5 and interviewee 2 added that the company should train and educate

people about the goals of Enterprise 2.0 technologies, and also in how to use these technologies as well as work towards a change in the behavior of business leaders.

As a result, the deployment and success of Enterprise 2.0 comes slowly since the new social technologies require both technological and behavioral change. Enterprise 2.0 is a long haul (McAfee, 2009), mainly because of challenges like management experience and culture change.

Table 5.2 summarizes the challenges behind Enterprise 2.0 in both literature and empirical findings.

Table 5.2: Comparison between the literature and the empirical finding about E2.0 challenges

consequence question	Comparison	Category	Risk/concern	Responses
What are the challenges behind using Enterprise 2.0?	Literature	Red herring	Inappropriate behavior & content (McAfee, 2009)	- It is a norm that all contributors who contribute on intranet have to reveal their names. - Self-policing means that communities of a company should react to any misbehavior. - Awareness and reaction of informal leaders can also change some unsuitable behaviors. - Many people are experienced and know how to use the platforms to meet the organization's goal.
			Inaccurate inf. (McAfee, 2009).	Self policing should correct the wrong inf.
			Embarrassing inf. (McAfee, 2009)	Volvo-ITan benefit from the negative feedbacks to develop their products and services. Also, people who read the negative feedbacks will trust the positive ones.
			Stealing inf. (McAfee, 2009)	People should know that the benefits of Enterprise 2.0 overweight the risks.
		Long haul	Unilateral control (Kofman, 2003; McAfee, 2009; Newman and Thomas, 2009)	- Businesses leaders should follow espoused theory instead of theory-in-use. - Champions who are mostly younger people should educate the older people about the use and the goals of E 2.0.
	Empirical findings	Security issue	How to create a balance between accessibility & control.	Managers define and develop guidelines. These guidelines are different from one company to other e.g. Capgemini follows security rules like policy, Information Classification Model, RA, IRM and Proxy. Company X puts guidelines like core values, online identities and policy. Volvo-IT is using policy.
			Inappropriate behavior & content	Norms and self-policing.
			Inaccurate inf.	Capgemini uses CIA, BIBA, Bell lapadula and policy while Company X and Volvo-IT use policy.
			Embarrassing inf.	They can develop their products based on the negative feedbacks.
			Stealing inf.	Policy and security measures.
		Culture change	- It is hard to get people changing the way of their communication and behavior. - Employees do not share inf. with their customers so that the latter need them.	Enterprise 2.0 requires both behavioral and technological change. This means that the employees should train and learn to understand the new technologies and how to behave in order to use them successfully.
		Management experience	- Lack of familiarity and experiences of using web 2.0 technologies. - Managers deploy web 2.0 because they think that young people are more familiar with these technologies	The company should end job due to age through educating the employees about using web 2.0 technologies.

6 Conclusions

This chapter highlights the general conclusions in relation to the research question and consequence question as well as the purposes of the research.

6.1 Conclusions

The main purpose of this study is to describe and explore the use of web 2.0 technologies within and between companies. So, I posed the following research question:

> ❖ How are global companies using web 2.0 technologies?

In the three companies where the use of web 2.0 has been examined, the interviewees were happy and satisfied with the use of these technologies.

The conclusion that has been reached from both interviews and literature is that these technologies have both interesting similarities and differences.

The similarities of web 2.0 technologies make these technologies share a common drift. The drift is that all these technologies are peer to peer and extremely relevant to all companies that want people to interact and communicate with each other, contribute with their ideas, knowledge and experiences without following predefined and imposed rules. The new social technologies open the way for businesses to develop ideas, products and solve problems.

On the other hand, web 2.0 technologies are not same and do not have the same uses but instead they are different and used at different levels of the Enterprise Bull's eyes for different tasks and purposes. Wiki is used at the strong ties level to support the strongly tied colleagues, SNS is used at the weak ties level to connect weakly tied people, and blogosphere is used at the potential ties level for converting the potential ties into actual ones. Consequently, the empirical findings showed that the reason which makes web 2.0 technologies valuable within these levels is that these technologies have different purposes: the wiki is used for documentation purposes, SNS is used for connecting people with each other, and the blogosphere is used for discussion purposes (linking people and content with each other, commentary and cross references).

The empirical findings also revealed that the uses and tasks of web 2.0 technologies differ from internal uses into external uses. This makes each web 2.0 technology powerful at different levels of the Enterprise 2.0 Bull's eyes e.g. Yammer and MySite are internal SNS which are used at the first level of strongly tied colleagues for sharing knowledge and communication while Facebook is an external SNS which is used at the second level of weakly tied colleagues for increasing the contact with weakly tied people (for further examples see the empirical findings in table 5.1). The other thing which has been noticed from the interviews is that each company and even department is using web 2.0 technologies in different ways from other companies and other departments. The reason for this difference is that each company uses web 2.0 tools in a way that meet its specific

purposes and goals i.e. One company uses a number of blogs (blogosphere) internally while other uses just one blog and this blog is shared between team leaders and team members, or one branch of a company uses internal blog while other branch of the same company uses external blog (for further examples, see table 5.1).

Thus, if you want to use Enterprise 2.0 tools properly, you should think about what problem, task, purpose or opportunity that you are trying to address and then deploy an appropriate technology in response to that.

The result of the empirical findings however revealed that not all companies are using web 2.0 technologies externally because of some challenges that hinder the further success of these technologies. So, the following consequence question has been raised during the interviews:

- ❖ What are the challenges behind using Enterprise 2.0 technologies?

This empirical findings showed that the main obstacles for the further success of Enterprise 2.0 are culture change, the security issue and management experience. These barriers grow when companies consider expanding the new social technologies and opportunities to external group such as partners, customers, suppliers etc. However, the security issue is a red herring because this issue is not a serious risk in comparison with the culture change and management experience which make Enterprise 2.0 a long haul.

Since Enterprise 2.0 technologies have some challenges, there will be significant differences in companies' capabilities to exploit them. Some companies use the new social technologies for developing ideas and changing their organizational structure to become more social like Dell and Procter & Gamble while others do not. These differences are issues that prevent the further success of Enterprise 2.0 in some companies. If business leaders want to get their Enterprise 2.0 implementation to succeed and reach its full potential, they have to address Enterprise 2.0 challenges by encouraging and stimulating people to use the new technologies both internally and externally, ending jobs due to age, training and educating people in both behavior and technology and developing guidelines that create a balance between accessibility and control. These guidelines are not necessary to be same at all companies (see the empirical finding concerning the security issue in table 5.2).

As a result, the interviewees stressed that the opportunities of Enterprise 2.0 will be greater when companies use web 2.0 technologies not only internally (on intranet) but also externally (on extranet) because Enterprise 2.0 technologies allow new good ideas, talents and innovations to emerge from individuals and companies around the world, and can change the community towards more openness and agility. If companies exploit these technologies properly, they will build a genuine relationship with the outside world and gain a keener understanding of their partners. If the companies misuse web 2.0 technologies or lock themselves from the opportunities of these technologies because of Enterprise 2.0 challenges, the risk as anonymous, inflexible and arrogant will be greater.

<u>Appendix A</u>

Interview's Basis

Procedure

Step 1: Introduce myself to the interviewee in sense of education background.
Step 2: Explain the purpose of the interview and the reason of my conducting of the interview.
Step 3: Explain the rights of the interviewee in context of his/her confidentiality, anonymity of the interview and request for inform consent.
Step 4: Ask the interviewee whether he/she has any questions, clarifications or concerns before starting to record the interview.
Step 5: Ask for the permission to use interview tools such as tape recorder, Camera etc.
Step 6: Start Recording and ask questions according to the themes below.
Step 7: Questions.

General Question:

What is your background and experience in the use of web 2.0 in the company?

Using web 2.0 technologies in business:

Which of these social media technologies (blogs, social networks and wikis) are used in the company?

Do you use social media internally or externally?

How do you use blog, wiki and social networking sites?

How do social media technologies contribute in the progress of the business at the company?

If the company could use social media technologies to link its outsiders into its development projects, could it come up with better ideas for new products and develop these ideas more quickly and cheaply than it today?

What is the difference between social media technologies on Internet and common business applications?

Enterprise 2.0: Challenges

What are the barriers if any to the further success of your web 2.0 technologies?

How do you make a balance between accessibility and control?

How do you avoid risks such as inappropriate behavior and content, inaccurate information, embarrassing information and theft?

Step 8: stop recording and ask the interviewer whether he/she wants to add comments or questions that can be answered by the interviewers. (Debriefing)

THANK YOU FOR YOUR PARTICIPATION.

Appendix B

Transcriptions of the Interview with Daniel Terborn/ Capgemini Sweden-Malmo/Technology (Interviewee 1)

N: standards for Noor's questions (researcher); D: standards for Daniel's answers (interviewee 1)

N: what is your background and experience in the use of web 2.0 at the company?
D: I am a team leader for the Development and Integration. I am also consultant- a system architect developing portals that use web 2.0 technologies.

N: have you understood the purpose of the research that I sent you?
D: yes, your focus about the usability of web 2.0 tools regarding knowledge sharing.

N: which technologies do you use in this company?
D: we use quite a lot of tools at day. We use both of internal tools that we use for own benefits and system marketing tools and also we sell web 2.0 solutions to outlines.

N: which of these social media technologies (blogs, social networks and wikis) are used in the company?
D: we use blogs, wikis and social networking. We have also KM 2.0 which is a combination of wikis, blogs, forum, document management that we use internally.

N: for which purpose/s (internal, external or both) are blogs applied in the company?
D: we use blogs for internal and external communications.

N: how do you use blogs for knowledge sharing?
D: The blog is a perfect media for communicating, sharing knowledge and learning about other teams. All teams have one blog full of knowledge and each time we use blog and share knowledge. Team leaders and I am one of them post information on one blog and team members comment it so we can learn more about other teams and that is successful factor for that blog.

N: do you use RSS and blogs together?
D: yes, we can combine RSS with blogs to get strong technology because RSS notify us about the changes happen in Blogs

N: do you use blogs for solving problems?
D: blog is more about sharing knowledge but it is not about communicating for solving problem.

N: are you satisfied with using blogs?
D: using blogs internally is fine. Externally, our CTO blog is powerful and our blog is active so we communicate with each other but we need to do more with it.

N: do you use blog for customers' feedback?
D: we do not generally use blogs for customer feedback. Blog is not a very powerful tool for collecting feedback. It is a great one-way communication channel however, for feedback purposes there are much better tools available.

N: how do you use wikis for knowledge sharing?

D: wikis are powerful tools if we want to collaborate about information so we can create wiki page and share the knowledge that we want to share.

N: do you use wikis internally or externally?

D: we use global Wikis internally but we use project wikis for sharing knowledge in projects (with partners and clients) and also for sharing knowledge internally.

N: how do you use wikis for knowledge sharing in projects (for both clients and partners)?

D: with a Wiki, all participants can contribute to the information contained within the Wiki. It is simply a way to build a common understanding between peers.

N: which one of web 2.0 technologies do you use a lot?

D: blog is easiest one because its use is similar to email.

N: how do wikis contribute in the progress of the business in the company?

D: wiki is a powerful tool for sharing ideas about methodology, technologies, etc. for example, Capgemini Holland has created accelerated delivery platform that uses agile methodologies to enhance our projects. This entire knowledge has been created on wikis.

N: how are social media technologies contributing in the progress of the business in the company?

D: social media tools are peer to peer. These tools together create a more powerful, business environment because people can participate with their ideas, knowledge, experience, etc. So web 2.0 tools empower the individuals and improve knowledge sharing and communication.

N: how is the company using social networking for knowledge sharing internally?

D: we have created a Capgemini Yammer group. Yammer is internal social network and it is all about discussing, communicating and sharing knowledge. Yammer lets me follow other and other follow me by creating network. It is really perfect technology.

N: do you use facebook for knowledge sharing?

D: we as a company do not use Facebook for "knowledge sharing" **with our clients** today and we think that it may not be the right channel for that purpose. It is, however, an excellent marketing and recruitment channel for Capgemini. Capgemini already have a Facebook group for this purpose. We however, use a somewhat similar tool - Yammer – for internal knowledge sharing.

N: what is the difference between social media technologies on Internet and common business applications?

D: web 2.0 is peer to peer. That means people can contribute to it and share knowledge while common business applications are not like that.

N: have you cancelled the role of common business applications?

D: we cannot cancel the role of traditional technologies. We prefer using blogs for information sharing but we still use email for notifying team members even though it is old technology because RSS which is the basic of blogs and informs us about changes happen in blogs is not always working with technologies we have on both internal and external network and most people do not subscribe to RSS. The combination of old technologies with new technologies is powerful for company.

N: If the Volvo-IT could use social media tools to link its outsiders into its development projects, could it come up with better ideas for new products and develop these ideas more quickly and cheaply than it today?

D: yes of course. When people communicate with each other and share their knowledge using web 2.0 tools, they can come up with better ideas.

N: what are the barriers if any to the further success of your web 2.0 technologies?
D: web 2.0 tools are open and we have a lot of knowledge secret which we do not want to share. So this is the biggest challenge with using web 2.0 tools.

N: how are you making balance between accessibility and control?
D: if we control the accessibility of social media technologies, they will lose their functionality so it is better to share our secret knowledge internally with people that we trust and we share branding knowledge externally.

N: how do you face risks such as inappropriate behavior and content, inaccurate information, embarrassing information and theft?
D: by defining guidelines and following the security rules.

N: do you think that web 2.0 technologies are used for knowledge sharing?
D: definitely. Wikis and communities such as Yammer are built for especially this purpose.

N: do you have something to add?
D: no.

Thank You for Your Participation

<u>Appendix C</u>

Transcriptions of the Interview with Mr. Johan Bergelin/ Capgemini Sweden-Stockholm/Consulting (Interviewee 2)

<u>N: standards for Noor's questions (researcher); J: standards for Johan's answers (interviewee 2)</u>

N: what is your background and experience in the use of web 2.0 at the company?

J: I am employed at Capgemini Consulting's Business and Information Strategy Practice-Stockholm. I have broad experience of management consulting from sectors such as Finance, Public, Energy and more. My main focus is innovative IT solutions using web 2.0 technologies. I am heading up Capgemini Sweden's work in this area.

N: which of these social media tools (blogs, social networks and wikis) are used in the company?

J: we use global wiki, external blog but not internal blog, and we try to implement social network globally. We have also KM which is in away social but its implementation is not social.

N: what do you mean by KM is not social implementation?

J: this means when I log into my Capgemini account, I cannot automatically log into KM technologies so I am not getting feeds. That means they have not chosen the correct way of implementing the tools. When rolling out these kinds of tools it is essential that you use an iterative approach and building from the ground in the company (with sufficient support from the top). We have used an approach that is more similar to roll out of big ERP-systems

N: what is the purpose of using blog in your company?

J: we use blog externally. The purpose of blog is to come as a part of community and try to discuss in strong voice...it is important to differ between communicating in one way (shouting or just pushing information) which is used in marketing and communicating by discussing with community...so what I hope with blogs is that we discuss and a lot of other smart people come there and comment and they link us and we become a part of community. So it is important to realize that blog is used for discussion purposes.

N: how do you use blog?

J: we use blog to discuss with people that they are interested in the same thing that we are. Hopefully, when people try to find knowledge, they search about it by Google and say, oh! Capgemini has this knowledge that we are interested in. For example when you search about consulting, you will find Capgemini on the top. So blog is a way to build a relationship with other people by discussing with them and link them and they link us.

N: how do you extract knowledge using external blog?

J: we use blog to come in community, see who link to us and get input regarding our interest. So blog is a powerful tool for participation and discussion. However, for companies, blog is not the best tool for extracting knowledge but instead Dell idea storm is better than blog for achieving that purpose.

N: do you have any idea about using blog internally?

J: when blog is used internally, people start by finding right people to collaborate, discuss and share their knowledge with and document their findings in wiki.

N: do you use wikis internally or externally?

J: we use wikis internally but there is no reason why we should not be able to use it externally to share part of knowledge in the heart of wikis with our key customers specially in a business environment where we have very specific needs for certain finds and how do we capture that...now a day we use email to achieve this purpose and we get many documents in different places whereas by wiki let see truth in one place...so there is no reason why we could not use wikis to share knowledge that has been already shared but in more effective manner.

N: how do you use wikis for knowledge sharing?

J: wiki is a way where we should go and find the latest "truth" for company...we use it for example to document best practices, we can document in consulting world, we can document how we run a project and how to run model and so on and then we have big repository for storing references to see how we get the knowledge and what is good or bad...it is important to realize that wikis are for documentation purposes but not for discussion.

N: If you get a document from other people that you do not trust, how to control the accessibility?

J: this is good question. Managers should develop and understand guidelines about how to manage knowledge or create security in terms of this kind of problem. These guidelines are different for each company. Before Email has security issue when just senders and receivers know the knowledge found in the email and therefore that is fine for managers.

N: I think many companies concern about how to make a balance between accessibility and control as security issue and therefore they are afraid from using web 2.0 tools.

J: yes of course that is a big management issue.

N: How do you make a balance between accessibility and control using wiki?

J: we can only access wikis internally so you cannot login to knowledge that we do not share. But that is not the reason for why we could not share part of wiki. However the massive pass that goes into it not from technical perspective because technical perspective is easy but from management change culture is extremely.

N: how do you use social networking?

J: We are working on social networking right now and our functionality on it. Our KM is partly social and it could be better when we use the social network.

N: do you use Facebook for knowledge sharing?

J: I started Facebook group for Capgemini recruitment and our functionality is still on it. We would use facebook externally. However, I do not think that facebook is good for storing or sharing knowledge because the purpose of the facebook is to increase contact with weak tied people and give us the opportunity to discover things that we do not have clue about.

N: how do social media tools contribute in the progress of business at the company?

J: in Capgemini Consulting, recruitment is really good area to use social media tools more because recruitment is a great area to use external social network to create participation in discussion and finding stuff may be not now but it could be in future.

N: what is the difference between social media tools on Internet and the classic business applications?

J: it is matter in social media is how you behave. A company that uses online social media is vastly different from companies that use just IT applications because it is matter in social media is how we behave. If we just go out and shout as in marketing style, we will be shut down directly and no one will listen to us. But social media is a platform that allows more communicating and listening rather than running an application. That is completely different behavior that we need to adopt in order be successful.

N: which is better KM or KM2.0?

J: of course KM 2.0 is better because if a company has traditional KM, knowledge managers sort the knowledge according to predefined set of sorting rules that means they have specific taxonomies. But when social media is used, the community itself will sort the knowledge.

N: if the company could use social media tools to link its outsiders into its development projects, could it come up with better ideas for new products and develop these ideas more quickly and cheaply than it today?

J: Today, not so much but of course they could. Dell idea storm that I pointed to before is a great example for developing ideas within the company. Connect and Develop innovation model that has been built by Procter & Gamble is another efficient example. Connect and Develop model allows scientists within the company to post problems that are needed to be solved throughout their global networks of social media in order to find smart people from different departments and companies around the world that are ready to solve the problems. Then the network comes up with a great innovation that contributes in developing new products and solving problems within businesses.

N: what are the barriers if any to the further success of your web 2.0 or social media tools?

J: One of the concerns is culture change which means how a Volvo-IT changes its behavior to get benefits of web 2.0 internally or externally because some companies put web 2.0 tools in a place and no one uses them. The other issue is security which companies have to take it seriously and know how to make balance between control and accessibility while using web 2.0 tools. The third big concern is a management experience which means many companies do not know how to use web 2.0 tools to derive their business benefits...some companies engage web 2.0 tools because they think that young people need them which is the wrong way of using web 2.0...they think that they have to have but not that they want to have.

N: do you have something to add?

J: no, thanks.

Thank you for Your Participation

Appendix D

Transcriptions of the Interview with Mr. Jesper Krakhede / Capgemini Sweden-Malmo/Security (Interviewee 3)

<u>N: standards for Noor's questions (researcher); K: standards for Jesper's answers (interviewee 3)</u>

N: What is your background and experience in the use of web 2.0 technologies at the company?

K: I am a security architect, employed as a Managing Consultant at Capgemini-Sweden in Malmo. My role for using web 2.0 is both as an ordinary user and as putting requirements of security on social media.

N: what are the barriers if any to the further success of your web 2.0 or social media tools?

K: some companies do not know how to use web 2.0 tools and therefore they cannot see business value and they think that these tools just waste their time. The other concern is about security when many companies do not know how to keep the balance between control the information and accessibility.

N: How do you make a balance between accessibility and control?

K: the answer is rather complex and is not completely a technical solution .For the sake of answering I will presume that the user is friendly and follows the rules set up.
   1. Definition of security. Security has to be viewed upon as an enabler of services. The mission for security is to enable services in a safe way.
   2. Risk analysis. A RA has to be done to determine the possibility of a threat for the company when using social media.
   3. Information classification Model. Certain types of information should be labeled as classified, i.e. not be allowed to share externally.
   4. We have to have policy which could determine which knowledge is allowed to be shared and which knowledge is not allowed to be shared.
   5. Security awareness. Personnel should undergo training to understand and learn about consequences of sharing information in web 2.0.
   6. IAM – Identity and Access Management. Every user should have a unique and traceable username.
   7. ERM - Enterprise Rights Management-tool. This should be used to encrypt information so that even if it is spread it is secured from viewing.
   8. Logging. All user actions have to be logged and information that logs will be used for prosecution in case of a breach.
   9. Monitoring of web 2.0. Users should allow monitoring of their usage.
   10. Proxy. To be able to block some content or words a proxy should be used.

N: you mean that you have to classify the knowledge into knowledge that could be shared just internally and knowledge that could be shared and accessed externally.

K: yes, that is right.

N: which knowledge can be shared and which knowledge cannot be shared?

K: the knowledge that is useable and has value could be shared. But the knowledge that has business value, important and specific for the company is not allowed to be shared.

N: do you use wikis, blogs and social networking internally or externally?

K: we use KM2.0 which involves web 2.0 tools internally.

N: do you use social media tools if you want to share knowledge with your customers?

K: it depends on what we do. Sometimes we use these tools to contact with our customers based on security rules that I mentioned before.

N: you may use social media tools to share knowledge with just people that you know outside the company.

K: yes, it is. We do not contact or share knowledge with whole the Company Xut just with people that we know.

N: I heard before few days that Google wave is another social media tool, do you use it?

K: No, it is useless.

N: how do you face risks such as inappropriate behavior and content, inaccurate information, embarrassing information and theft?

K: the most important is policies for stating what is allowed, logging to investigate incidents and retribution if policies are broken. We can also use CIA which refers to Confidentiality, integrity and availability. The three cornerstones of security as described in ISO 27001. We use also BIBA as a security architecture model for integrity and an access control system for making sure that information is correct. Bell lapadula is used for confidentiality. Regarding embarrassing information, we cannot change or delete what others write about us but instead we can develop out business and write about our progress.

N: how do you face risks such as theft?

K: you have to look on the information flows to determine if there is a high risk that information is stolen or is leaving the company using any or all of the social media pathways. If so you have to implement security measures to safeguard that those events to not actually become a reality. Those could be, block access to site, removal on offensive language using tools, pre approval of information and so on and so forth.

N: if you apply different tools and different models for keeping the security of your knowledge, why can you not use social media tools externally?

K: we use social media tools externally but not for knowledge sharing. Only for collaboration on whereabouts and for official thought leadership.

N: do you use wikis, blogs and social networking sites for knowledge sharing and how?

K: only internally. We have internal wikis and blogs. Some knowledge sharing is done externally but that is more from a branding perspective. Facebook is not for knowledge sharing at all. But we use it only for updates in collaboration.

Thank You for Your Participation

<u>Appendix E</u>

Transcriptions of the Interview / Company X/ Online Product Driver (Interviewee 4)

<u>N: standards for Noor's questions (researcher); W: standards for interviewee's answers</u>
  <u>(interviewee 4)</u>

N: What is your background and experience in the use of web 2.0 technologies at the company?

W: I am product driver and I have ten years of professional experience in online communication, continuously moving towards "Web 2.0" and social media aspects. I am personally an active participant in several social networks. I use social bookmarking and collaborative sites to learn more about my area of expertise. I create, write in and read many blogs and micro-blogs to keep up to date on areas of personal and professional interests.

N: Do you use social media tools internally or externally?

W: we use them internally.

N: which of these social media tools (blogs, social networks and wikis) are used in the company?

W: we use blogs for text and video publication / discussions, wiki and social network (Yammer).

N: for which purpose/s (internal purposes, external purposes or both) are social media tools applied in the company?

W: we currently use them for internal purposes to identify best practice and test the readiness of our employees. Externally, we do not use blog yet. I believe it is a good channel for open discussions, but there are still people who consider blogs to be mostly social and not entirely convinced that it would be beneficial from a business perspective. We want to turn that around and prepare for using blog more, both internally and externally.

N: how do you use blog?

W: we use blogs (in small scale as a pilot) primarily to discuss business matters within teams. We find that blogs decrease the time of meetings, especially when we try to find time for meetings with many people and simultaneously increase everyone's awareness about other projects and ensure that we do right thing. People discover that other people have experience in similar areas and can get help or feedback before doing the same mistakes as others, therefore we can benefit from trust and better quality.

N: do you prefer blog on email? Why?

W: yes, because the email is limited in its use that means just the sender and receiver can see it and other people cannot see it so they cannot share their knowledge or correct the wrong. But it all depends on purpose. There are private conversations and practical tasks that still have a place in one-to-one e-mail conversations, but for collaboration and collective learning and sharing, e-mail is not (and have actually never been) the right tool.

N: do you use blog to submit projects and get feedbacks?

W: yes, we use it to get feedback, ask for help about specific project or even if we do not know how to begin with special issues. We initiate a discussion and the people who have something to offer will trigger and respond. Otherwise I would ask my known immediate network and search for documents or other written information on the intranet (where it may not be available or found). So, blog is efficient way for discussing and getting early feedback from relevant people without knowing who to ask.

N: the external blog is good to get knowledge of new people but the trust is big issue, is it right?

W: yes of course. For employees who are used to online channels, blogs are basically web pages with the possibility to get feedback and initiate conversations, to others the word "blog" may be considered a buzzword or even have some negative connotation for those used to a more controlled way of communicating with external parties. We do not use blogs with our customers at this point.

N: which tools do you use externally?

W: marketing website and other tools, where we often include means of getting in touch with us, but we keep the interaction non-public (i.e. e-mails and direct messages to relevant employees).

N: how do you use wikis for knowledge sharing?

W: we use wikis internally as well. We started using wiki as an internal dictionary, but the use is taking off towards more advanced information that people can contribute to (help pages for applications and more detailed information on products, services and procedures). First we entered a dictionary of abbreviations that we had as a "traditionally" managed document, and we let people contribute to this. We had about 300 words to start with and with continuing the contribution after only a few months we had over a thousand abbreviations listed. Everyone has something to offer to this and it gets more complete and relevant for every addition.

N: do you have links with your abbreviations?

W: yes, the wiki is mainly trying to explain the context of an expression, a phrase, abbreviation or give a very generic overview of a specific product, service or procedure. Then there are links to traditional "official" pages with publishers/owners of the information on the intranet. There is also a huge project going on to secure the information and processes around the content and the usability of our intranet, and the wiki is an important part of this program. We are continuously striving for a task-based intranet, where the employees should get the best tools to fulfill their work tasks, including finding relevant information and connecting to the right people etc.

N: do you use wikis to share knowledge externally?

W: we are considering the possibility to use wikis towards customers to allow them to contribute to different types of information sources, e.g. technical service instructions or similar where their input directly from the factories could add to quality of documentation as well as give us instant feedback on our products and services. However, we do not use wikis externally today.

N: how do you use Social Networking Sites for knowledge sharing?

W: we do not use social networking sites such as Facebook or LinkedIn to spread our knowledge today. At least not from a corporate communications perspective. There are some market companies and local initiatives, where they have tried out this type of channels to spread specific information, e.g. on recycling benefits and similar, but there is still an ongoing discussion about the impact these efforts have on our brand and corporate image. Yammer is a micro-blogging tool that offers Twitter-style interaction while keeping the information exchange contained within the company's employees, but it's not promoted by us and not widely accepted as a daily source of networking or finding information.

N: how do social media tools contribute in the progress of the business at the company?

W: social media tools are part of the communications portfolio, and as the community we work in changes towards openness and agility we must change our communication to adapt to this environment. If we do it properly, the gain will be a greater understanding of our customers and partners as well as a more personal and genuine relation to the world around us. If we lock ourselves in or if we misuse these opportunities, we risk being perceived as anonymous, inflexible and arrogant. The long traditions of our Volvo-ITause us to be somewhat cautious about approaching these channels in the wrong way, but we do know that there is much reward to find on this route.

N: does blog contribute in the progress of business at the company?

W: yes, in many ways. One example is meetings; with active internal blogging, people have a better knowledge of the background about the meeting so they do not have surprises presented in the meeting, but it also reduces the amount of meetings necessary (many meetings are discussion meetings and information meetings, not decision meetings). Today we basically just need decision meetings, and they become more efficient. But in more abstract ways, blogs contribute to an overall awareness of what is going on in different areas, which makes every employee more engaged, involved and they get a feeling of responsibility when they have a broader perspective. You don't need to know the details, you may even not understand the issues mentioned, but you do have a better chance of representing the Company X better when you are more aware of what is happening in other departments, other projects and so forth. Also, being able to contribute to other parts of the Company X breaks the departmental isolation that is so common in large corporations, especially when spread over the entire world.

N: does wiki contribute in the progress of business at the company?

W: definitely, we have more accuracy, more width of knowledge on wiki which people use more and more because it is most relevant and valid. It takes less total work time and the information becomes more valuable for the right people to update it when appropriate than it would take for someone with limited knowledge (and we all have incomplete knowledge when it comes to this range of information) to gather the information by asking around.

N: what is the difference between social media tools on Internet and common business applications?

W: regarding traditional business applications, people can share a secured file because just the sender and receiver can see it. However, people do not contribute if they do not have knowledge or people have to know who to ask, or they may lose some emails. In any case, the knowledge leaves when the employees leave, while using social media tools the information is online so when new parties join in, they can quickly get into the discussion history and start to contribute. Old discussions can be picked up and revived when relevant and people join and leave the discussion as they see fit. So, social media tools will allow people to keep discussing and contributing, regardless of their current position within or outside the company. Common business applications should (in my opinion) focus on securing official or business critical information so that our core transactional processes will work. In these cases, you would not want people to change the information at any given time or to display confusing messages in the wrong context. There will probably be a place for traditional business applications, static documents and e-mail conversations for a long time still, but the relevance, accuracy and development of information in all of these channels and tools can definitely benefit from having a parallel and supporting dialogue in internal and external social media tools.

N: what do you think about Google wave?

W: some people at the company connect to it. Google Wave connects the email with collaboration tools like integrated live chatting, collaboration on documents, sharing of images, maps and videos etc. It's very interesting and has great potential. But the biggest problem with Google Wave in its current shape is finding people to connect to. Google Wave lets us find people only by providing it with a known e-mail address, instead of via my network or by their interests, area of expertise or even geographic location. So they can just find people that they know before but they cannot find new people in the second degree and discuss with them. Connecting people efficiently is a crucial part of the added value of social media. It's not just the written information a person can provide to another person that is important; the relation in itself and how it is initiated, maintained, developed and supported is equally relevant.

N: but you can use social media tools externally by dividing the knowledge into knowledge that you want to share and knowledge that you do not want to share.

W: absolutely that is right. But many companies like us are dividing much of our communication efforts into internal and external communication and keep the nature of this information very different. In this way the people that communicate internally do not always understand or interpret things the same way the people that communicate externally. I personally believe this will change, and that we will move towards a more transparent and coherent way of moving the information through the organizations from internal to external without mixing the message with errors, rumors, estimates etc especially when the products are complex and the audience ranges from dairy farmers, end consumers or equipment technicians to efficiency analysts, CEOs of suppliers or customers and marketing people. This change is a great challenge to many large corporations today.

N: who is modifying the messages?

W: we at Company X will most of the time create a lot of internal documentation during product development and other internal work. This documentation is rarely optimized for being read and understood by external parties. It's the same facts which are understood differently by a different audience. We are not manipulating data, merely simplifying the presentation.

N: what are the barriers if any to the further success of your web 2.0 or social media tools?

W: first, the management does have a fear of losing control over our communication, our brand and this is primarily because they want our customers to be able to trust what we communicate and not be confused by mixed messages, preliminary technical specifications and so forth. Second, we sometimes treat information as something we must keep locked in so that our customers need us, and we don't really want to have that kind relation with our customers. We are moving to an information climate where you share the information you have and then offer your expertise to turn this information into actual business value in the customer's specific reality. Third, there is a challenge in offering technical solutions that are intuitive to all users and does not require too much training, while many employees are still not used to online interaction (especially publicly exposed) on communication platforms in a work context. Many don't even have experience in working with social media tools for personal purposes. To some extent, this is of course both a generation issue (people) and a technological issue (tools). Both people and tools get more and more "compatible" over time, and we should expect and embrace this development. Facilitating the transition can help us so that we do not divide the work force into "connected" and "not connected".

N: can you explain more explicit the first challenge?

W: What I meant was that we have many products and a lot of responsibility to communicate the right information about them, so that our customers and other business partners make their decisions based on actual facts. If we have a multitude of communication channels, where individuals communicate on all levels with any client, partner or customer, they may provide a confusing and maybe even contradicting message where facts are mixed with guesses, estimates, rumors and even errors. A lot of information is a good thing, but can blur the facts. If we get the communication culture right, people will know how to express opinion and separate that from official product specifications, but from managers this is of course a fear; that we will go from clear communication to unclear communication. In that sense, they fear losing control over the communication scenarios. However, as we know, the change is happening anyway, and it's more a matter of adopting in the right way than it's a matter of refusing or resisting the change altogether.

N: how do you make balance between accessibility and control?

W: this is one of the biggest concerns when introduction social media in the business sphere and so far we rely heavily on three things:

First, the social media tools we select should maintain an atmosphere of transparency and openness regarding who posted what. We believe being honest about who you are helps you keep the behavior as civilized as your everyday attitude in the workplace.

Second, we have a corporate culture driven and guided by our core values, which are continuously communicated and re-enforced. This way, instead of having strict and detailed instructions on every imaginable scenario, we let every employee interpret these core values (in combination with the more legal obligations that are defined with their employment contract and local jurisdiction of course). We are currently putting together social media guidelines to help people make the best choices, whether they are appointed as communicators on behalf of the company or whether they are employees with no such mandate, but these are guidelines to help people understand this specific area, pointing out specific pitfalls and how to avoid them – we still refer to the core values and other relevant guidelines and policies. The concept is basically individual freedom with individual accountability.

When it comes to classified material, such documents are kept restricted to as small groups as possible, and are not produced, stored or communicated in the more open channels where other work-related information can be found. This means that this type of information is clearly separated from other information and there should be no immediate risk of accidental disclosure due to the introduction of social media tools. Someone may still disclose parts of such documents by accident if they fail to see that what they say is actually a secret made public and that it may damage the company through the greater impact of global social media channels. However, the people with access to business-critical information are well trained in information security through special trainings that cover online communications as well as off-line risks such as talking about details over the phone or on a train with people around you.

Finally, when talking about confidential material leaking, this is always a risk and at any given point, an employee with sufficient access could potentially copy material onto a USB memory stick and transport this information outside the building. The social media tools will introduce the danger of a wider audience, but at the same time this also means a greater risk of being discovered and getting in trouble. So, breaking a confidence can occur with or without social media, but the transparency and public nature of these channels will simultaneously help us act upon information leaks (or alleged information leaks that may be false but just as damaging) which to me is a balance to be aware of, but it's not a reason to avoid social media or to argue that the potential risk is greater than the benefits.

N: do you have something to add?

W: no, thanks.

Thank you for Your Participation

Appendix F

Interview via Email with Volvo-IT /Sweden- Gothenburg (Interviewee 5)

N: standards for Noor's questions of the researcher; V: standards for answers of interviewee 5

N: What is your background and experience in the use of web 2.0 technologies at the company?
V: Volvo and Volvo IT is a global company so we are all working globally.
Sven Åke, I am working with business operational excellence for the Volvo IT sites outside Gothenburg.

Those who had answered the questions are **Caroline Adamsson**, working with development, implementation and support of collaboration solutions to Volvo IT customers in Sweden, who have operations outside Gothenburg and also to Volvo IT locations in Sweden outside Gothenburg.

Donabedian Vahagn, manager Content and Collaboration solution center in Lyon, whose mission is to contribute to the efficiency of our customers globally (mainly AB Volvo BA/BU and Volvo Cars) virtual teams by offering and supporting cost effective collaboration solutions and business value through professional services. They aim to deliver and maintain a consistent range of products and services that help our customers to increase their capacities to lead collaborative work and gain in creativity and productivity.

N: Which of these social media tools (blogs, social networks and wikis) are used in the company?
V: Blogs, social network and wikis.

N: For which purpose/s (internal purposes, external purposes or both) are social media tools applied in the company?
V: Internal purposes.

N: How do you use social media tools (blogs, wikis and social networking) for knowledge sharing?
V: In fact we are using blogs and wikis in our Teams Collaboration solution (based on SharePoint 2007) and social networking is also bases on SharePoint capabilities to provide a personal site called MySite.

Blogs are used mostly as on Internet to share though, knowledge and also to generate discussions or debate. We use blogs in different levels within our Company X both as dialogue between management and employees using postings, comments. We also use blogs for: Questions and Answers - it then becomes a very strong sharing knowledge tool.

Wikis are more used to produce knowledge and share it (with links and pictures) or to create and maintain information commonly (by all team members).

 MySite is used to share his own information (could be also done in a blog hosted in MySite), to see his colleagues, to share documents in Draft mode etc.
All these solution are only for an internal purpose and not for external communication or sharing.

N: how do social media tools contribute in the progress of the business at the company?

V: the key success factor is accepting the fact that this is more than just a new set of tools. To get the most out of it, it's necessary to change behaviors and culture and train people to understand the use of these technologies.

N: if the company could use social media tools to link its outsiders into its development projects, could it come up with better ideas for new products and develop these ideas more quickly and cheaply than it today?

V: yes, any kind of additional collaboration and sharing knowledge even if the target group is extremely small could bring effectiveness. If you can share knowledge without any special demands on network and security policies and hw/sw it is always easier to reach goal faster and cheaper.

N: what is the difference between social media tools on Internet and common business applications?

V: usages of modern tools make business more attractive for new generation employees and make companies more global. However, these tools often are adaptation of Internet tools into a Business environment so Business should integrate and understand in which way use them.

N: what are the barriers if any to the further success of your web 2.0 or social media tools?

V: generation gap, training and education, security policies. There exist a generation GAP in the company and it will probably disappear during time when people end their jobs due to age; young people are more familiar with web 2.0. Company needs to give people more training and education in both behavior and tools to succeed in web 2.0 use. Security policies are important when working with people outside company.

N: how do you make a balance between accessibility and control?

V: by understanding security rules stated in Global level within company. The key is to have all employees understand what's ok and not ok to communicate – regardless if they're participating in discussions in the social media sphere or if they're attending a dinner party.

N: How do you avoid risks such as inappropriate behavior and content, inaccurate information, embarrassing information and theft?

V: It could though be necessary to have some basic education and various information initiatives to guide users (the old generation) to create a mature and professional culture in the use of social media. **The risks** are in this case of minor importance when the gains that can be obtained by making use of social media valuable and an enriching experience at every level.

N: do you have something to add?

V: nothing.

Thank You for Your Participation

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